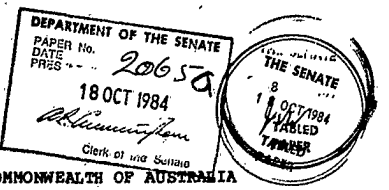

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

JOINT COMMITTEE OF PUBLIC ACCOUNTS

REPORT 225

STRATPLAN - DEPARTMENT OF SOCIAL SECURITY ADP RE-EQUIPMENT PROGRAM FIRST REPORT

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DUTIES OF THE COMMITTEE

Section 8.(1) of the Public Accounts Committee Act 1951 reads as follows:

> Subject to sub-section (2), the duties of the Committee are:
>
> (a) to examine the accounts of the receipts and expenditure of the Commonwealth including the financial statements transmitted to the Auditor-General under sub-section (4) of section 50 of the Audit Act 1901;
>
> (aa) to examine the financial affairs of authorities of the Commonwealth to which this Act applies and of intergovernmental bodies to which this Act applies;
>
> (ab) to examine all reports of the Auditor-General (including reports of the results of efficiency audits) copies of which have been laid before the Houses of the Parliament;
>
> (b) to report to both Houses of the Parliament, with such comment as it thinks fit, any items or matters in those accounts, statements and reports, or any circumstances connected with them, to which the Committee is of the opinion that the attention of the Parliament should be directed;
>
> (c) to report to both Houses of the Parliament any alteration which the Committee thinks desirable in the form of the public accounts or in the method of keeping them, or in the mode of receipt, control, issue or payment of public moneys; and
>
> (d) to inquire into any question in connexion with the public accounts which is referred to it by either House of the Parliament, and to report to that House upon that question,
>
> and include such other duties as are assigned to the Committee by Joint Standing Orders approved by both Houses of the Parliament.

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PREFACE

When Cabinet gave approval to the Department of Social Security to re-equip its computer network it requested that the Joint Parliamentary Committee of Public Accounts monitor the project on behalf of Parliament. This was the first monitoring activity undertaken by the Committee and differs in scope and problems from the normal review role.

Due to lack of Secretariat staff no work was effectively done until February 1984 when an adviser from the Department of Administrative Services was seconded to the Secretariat. The Committee decided that it would be appropriate for the project to be monitored through public hearings. This approach was adopted to allow the Department to present its progress reports and submissions on specific areas of ADP in a manner that could not be open to misinterpretation.

To August 1984 there have been six hearings at which the Department has presented submissions on such subjects as project management, security and industrial relations. At each hearing the Department has presented progress reports and informed the Committee of any unforeseen problems that may have arisen since the previous meeting.

This report is intended to cover only those subjects that have been discussed with the Department and it is expected that a further report will be presented by the Committee during 1985. In this way it is expected that Parliament will be kept informed of the progress of this very expensive project.

The Committee expresses its thanks to Senator the Hon. Dame Margaret Guilfoyle DBE who chaired the ADP Sectional Committee and Mr Vincent Cleary who provided the Committee with technical and systems guidance. The Committee also thanks the permanent members of its Secretariat for the support given to this difficult exercise.

For and on behalf of the Committee.

Senator G Georges
Chairman

M J Talberg
Secretary
Joint Committee of Public Accounts
Parliament House
Canberra
3 October 1984

CHAPTER 1

INTRODUCTION

1.1 In this interim report the functions of the Department of Social Security are broadly outlined as are the characteristics of Stratplan. Topics that were discussed with the Committee are dealt with in the following chapters. These discussions covered:

- Acquisition Procedures;
- Health and Safety Aspects;
- Industrial Relations;
- Resignation of a Senior Officer;
- Offset Arrangements;
- Project Management;
- Financial Management;
- Security Provisions (not in this report); and
- Internal Audit Involvement.

1.2 The Committee acknowledges the help and support of the Department in the preparation of this report. The chapters which deal with the Departmental organisation and Stratplan in particular were summarised from submissions made to the Committee.

1.3 The Committee met with representatives of the Department of Social Security on six occasions as well as with representatives of the Public Service Board, the Administrative and Clerical Officers' Association and the Capital Territory Health Commission. A list of witnesses who attended and dates of hearings are at Attachment F. Submissions made by the Department and the Administrative and Clerical Officers' Association are attached to this report as is a report to the Minister for Social Security regarding the resignation of Dr Prince from the Department and a submission by a Department of Health officer.

1.4 It is expected that in the next twelve months, the Department will be asked to make submissions on the following topics:

- Experience with SDM/70 (a systems methodology package purchased by DSS and used by senior users of Stratplan);

- Contingency planning;
- Clerical procedures;
- Communications strategy;
- Department's Corporate Plan;
- Job impact studies;
- Interfaces with other Commonwealth systems;
- Future accommodation and staff requirements;
- Security; and
- Training.

1.5 Stratplan is the most expensive computer system implemented in the Australian Public Service. Many lessons will be learned from it and interested persons are invited to attend future hearings.

1.6 The Committee believed that the health and safety issues that were raised in this examination were important and has therefore decided to issue a number of Appendices to this report as a separate volume.

CHAPTER 2

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

2.1 This Chapter provides in summary form the conclusions and recommendations of the Committee. These are cross referenced to the body of the report and should be read in context.

Stratplan (Chapter 4)

2.2 The Committee has concluded that:

- Stratplan does not improve the quality of the information regarding clients of the Department but it makes this information easier and quicker to change and retrieve.

- No new technologies have been developed for Stratplan. It is not technically complex but because of its size it is difficult to manage. The complexity of the project has been largely created by the Department's decision to centralize its information base and to access this base via up to 7000 on-line terminals.

- The Australian computer industry has benefitted by the Department's extensive use of contractors and some program aids.

- The tender should have placed greater emphasis on Australian products.

- The Department has been successful in:

  - the installation of equipment in the new National Computer Centre and in the State Centre in Sydney both of which required substantial alterations to buildings;

  - the training of thousands of its staff including the production of three video training films;

  - the promotion of a general acceptance of Stratplan by staff at all levels;

  - the initiation of automated systems and project management methodologies;

  - the recruitment of new staff and contractors;

- the formulation of procedures for the efficient purchasing of Stratplan equipment, engagement of contractors, budgeting and estimating; and

- the research and documentation of security systems and the draft Contingency Plan.

. The first regional office appears to have been delayed by nine months due to industrial issues and technical difficulties and that the facility for on-line update will be at least twelve months late.

2.3 The Committee recommends that:

1. The Contingency Plan be completed and tested and the Committee informed of the results before implementation of the Queensland phase is completed.

Acquisition Process (Chapter 5)

2.4 The Committee has concluded that:

. There was extensive use of independent advisers in all stages of the process from the original review of the Strategic Plan to the final tender evaluation.

. There has been appropriate top level commitment to the project from within the Department.

. The Public Service Board (PSB) and other regulatory agencies contributed to the process as did the Offsets Secretariat, the Departments of Administrative Services, Housing and Construction and Industry and Commerce.

. Except that officers who would later use the system were not consulted in its design, the Department's acquisition process followed the guidelines laid down by the appropriate authorities. The aspect of staff involvement is discussed in Chapter 7 - Industrial Relations.

Health and Safety (Chapter 6)

2.5 The Committee has concluded that:

. The Department of Social Security, with the help of staff, qualified ergonomists and the Commonwealth Institute of Health, has done an excellent job in designing furniture and

terminals. The Department employs one occupational health and safety officer and is attempting to change work practices so that one operator may not operate a keyboard for more than 3 or 4 hours per day.

2.6 The Committee recommends that:

2. As a matter of urgency, the National Occupational Health and Safety Commission carry out a full investigation of the hypothesis known as visually evoked responses in photosensitive persons.

3. Staff associations be encouraged to consider Dr Burch's hypothesis and participate in any investigations.

4. The suggestion that staff should be multiskilled rather than solely keyboard operators be considered as a basic principle of employment by the Public Service Board and other appropriate bodies as a matter of urgency.

5. All health and safety problems be referred to the National Occupational Health and Safety Commission which will take over much of the occupational health responsibilities from the Public Service Board.

6. All future instructions from any authority to the Department on health, safety and industrial issues be issued as directions not draft guidelines, guidelines, or recommendations.

Industrial Relations (Chapter 7)

2.7 The Committee has concluded that:

. Industrial relations between staff and management are difficult due mainly to the inability of the Department to provide health and safety tests to employees regarding eyesight and possible radiation emission problems from screen based equipment.

. The Department is constrained by the Public Service Board which is responsible for setting standards for staff conditions of service.

- The issues of industrial relations, particularly in the areas of occupational health, could have been resolved in the planning stage with agreement between the PSB and staff associations. This was made clear by the Director-General in his letter to the Chairman of the PSB on 4 June 1984 when he said:

> 'This Department has two issues relating to occupational health and the introduction of Stratplan which are the subject of dispute with the two relevant staff associations. The first is the question of eyesight testing for VDU operators and the second radiation testing of VDUs.
>
> 'There seems to me to be an element of insanity in an industrial dispute between a Commonwealth department or agency and unions on occupational health issues. Obviously, if there is a genuine health problem, as a responsible employer the Commonwealth should take all necessary corrective action. If there is not a genuine health problem, the taxpayer should not be held to ransom to provide unnecessary and expensive equipment and services which may also serve to create unnecessary anxiety in some staff.
>
> 'I fully support your view that these occupational health matters are too important to be negotiated in isolation by individual departments and agencies. It does seem to me to be an issue on which leadership is required from the Board. I believe that all Commonwealth employing agencies and the ACTU should be able to settle on common occupational health standards, based on the best advice available. I would ask that the Board initiate action in this direction.'

- The issues of eyesight testing for visual display unit operators and radiation emission testing of the visual display units themselves, should be resolved through negotiations between the Public Service Board and the staff associations.

2.8 The Committee recommends that:

7. **The Public Service Board, acting on behalf of all Government departments and agencies and in consultation with other appropriate agencies, establish and promulgate common occupational health and safety standards as a matter of urgency.**

2.9 The Committee has concluded that:

. *The Department of Social Security has taken some steps towards satisfying the demands of the staff associations through the supply of ergonomically designed furniture, the acceptance of regular breaks for keyboard operators and the issue of information sheets for staff on the progress of Stratplan. The Committee believes that within the limits imposed on it the Department has gone as far as possible in catering for staff associations' demands regarding health and safety.*

2.10 The Committee recommends that:

8. **The staff impact study be completed as soon as possible with special emphasis on expected staff savings and reclassifications. A consultant should be employed to stipulate the guidelines of the study in conjunction with the staff association. The Committee wishes to be informed of the results of this study before Stratplan is implemented in each State.**

9. **Staff, through their associations or via normal communication channels, be kept informed of delays or alterations to the system. This is particularly important for regional office staff.**

10. **The staff associations be asked to participate in the systems implementation and be invited to attend the weekly progress meetings chaired by the National Stratplan Co-ordinator.**

Resignation of a Senior Officer (Chapter 8)

2.11 The Committee has concluded that:

. *The procedures for ensuring propriety by Commonwealth officers accepting employment in the private sector have followed the established guidelines.*

. The Committee may wish to review the guidelines as a separate issue.

Offset Arrangements (Chapter 9)

2.12 The Committee has concluded that:

. The benefits of the offset program will be less than predicted.

2.13 The Committee recommends that:

11. All offsets agreements be signed prior to contracts being let.

Project Management (Chapter 10)

2.14 The Committee has concluded that:

. Project management is basically sound, principally because of the commitment of senior staff.

. There are delays in implementation caused mainly by the size of the project and difficult industrial relations.

. In spite of the use of almost 100 contract programmers, consultants and highly motivated and qualified staff, the system implementation will be up to 12 months later than predicted and this delay will probably be more pronounced as the implementation proceeds.

. The Department also failed to recognise the staff associations' concerns on health and safety matters and future job prospects of their members.

. The implementation timetable will be monitored and Parliament kept informed of progress.

Financial Management (Chapter 11)

2.15 The Committee has concluded that:

. The project will not realise the monetary savings suggested by the Department of Social Security when the original Strategic Plan was drawn up. Successive Ministers have been given an expectation of staff savings of between 2400 and 2700 as a result of Stratplan. It would now appear that these figures are unrealistic and that the Department has abandoned them.

. The Department did not fully investigate the alternative methods to on-line centralised processing.

2.16 The Committee recommends that:

12. The financial planning system be completed, if necessary with the help of external consultants.

13. The Department review the total project cost, including all attributable staff costs, in conjunction with the Department of Finance. The Committee would expect a submission on this matter as soon as the review has been completed.

14. The Department of Social Security review the cost effectiveness of the project in conjunction with the Department of Finance and advise the Committee accordingly.

15. Following the review the Department of Finance continue to oversee the personnel aspects and the overall costs of the project and report to the Committee on a regular basis.

16. The Australian Audit Office audit the system regularly and be assured that the Department's ADP Internal Audit has obtained the best advice on all matters of data and system security.

17. The Department report progress and problems on a monthly basis to the Committee and the Australian Audit Office. These reports should include discrepancies of time or costs from the planned schedule.

CHAPTER 3

DEPARTMENTAL ADMINISTRATION AND *PRESENT ADP SYSTEMS*

3.1 The Department administers a widespread and complex organisation at four distinct management and operational levels:

- Central Office;
- State Headquarters and Regional Directorates;
- Area Management; and
- Regional Office.

3.2 The Central Office of the Department is located in Canberra and is organised into Divisions:

- Legislation and Review Division - administers all appeals; reviews and maintains Departmental legislation; negotiates international reciprocal agreements, reviews policy on Commonwealth Employees Compensation;
- Benefits Delivery Division - develops, reviews and implements policy and administrative practices relating to the pensions and benefits provision of the Social Security Act;
- Development Division - develops policy initiatives in the broad field of income maintenance; undertakes research and prepares statistics;
- Systems Division - plans, develops, implements and maintains data processing systems;
- Resource Management Division - develops and administers manpower, property and financial management policies;
- Operations Support Division - specifies, tests and implements systems methods and proceedings *supporting the Department's Central Office* resource requirements;
- Office of Child Care - develops and administers a comprehensive range of services to cater for the educational, emotional and social needs of children;
- Rehabilitation Division - develops policies and administers legislation relating to the Commonwealth Rehabilitation Services;

- Subsidies Division - develops policies and administers legislation relating to aged, handicapped and homeless persons' welfare;

- Performance Monitoring - provides management consultancy service, monitors operations and conducts internal audits and examinations; and

- Office of the Commissioner for Employees Compensation - administers legislation relating to Employees Compensation.

3.3 The State Administrations in each state capital (headed by State Directors) and Regional Directorates (as distinct from Regional Offices) in the Northern Territory and Australian Capital Territory administer the provisions of the Social Security Act, including the granting and payment of pensions and benefits, Commonwealth Rehabilitation Service, aged, handicapped and homeless persons' welfare program and children's services program.

3.4 The State Administrations are organised into Branches:

- Welfare, Rehabilitation and Subsidies;

- Management;

- Benefits, Practices and Investigations; and

- Field Operations Controlling Areas.

3.5 The Area Management concept was introduced to improve the co-ordination of operations of a number of regional offices within the States. The Area Managers act as the representative of the State Director in defined areas of each State.

3.6 Their responsibility is to ensure that adequate levels and standards of service are being provided. Their role includes:

- ensuring the establishment and maintenance of an adequate network of offices in the area, having regard to the level and nature of the benefits workload and the accessibility of offices;

- managing and improving the overall performance of the area in delivering the services provided in terms of timeliness, quality and economy, identifying the need for systems improvement and organisation/establishment variations;

- oversighting the use of the staff resources of the area by ensuring that recruitment is timely, that staff are trained, developed and deployed to meet changing needs and that optimum use is made of the staff resources;

- coordination of the Department's welfare activities in the area; and

- representing the Department in the wider community, including co-ordination of activities with those of other Government departments and agencies.

3.7 A network of Regional Office administrations decentralise the Department's operations. The objective of regionalisation is to have each office handling all Departmental functions.

3.8 In general, Regional Offices have a staff of between 30 and 50. This allows for the organisation of the various work teams - such as benefit groups, welfare services, counter staff and administrative units - which form an autonomous Regional Office. These offices service areas with client populations which, in general, range up to 25 000 pensioners, 40 000 family allowance beneficiaries and 5000 unemployment and sickness beneficiaries.

3.9 As an extension of the Regional Office services, staff members attend at other locations - these are termed sub-offices and visiting offices. These provide some of the services of the Department without the overheads of the full Regional Office. Sub-offices are permanent locations while visiting offices are premises such as shire halls. A sub-office is manned some days of each week. Visiting offices are manned for varying periods at weekly or monthly intervals.

3.10 The Department also administers Rehabilitation and Training Centres. Most of these are located in the metropolitan areas of the State capitals.

3.11 The Department identified four major functional areas needing ADP support. These areas are:

- Income Security;

- Subsidies;

- Personal Services; and

- Management Services.

Income Security

3.12 The Income Security area of the Department covers the payment of benefits, pensions and allowances to individuals. These are currently running at some $15,000 million per annum in respect of some 4 million recipients. Payments are made either fortnightly or monthly and comprise:

- 62 million cheques per year;
- 25.5 million payments per year to banks, building societies and credit unions; and
- 1.35 million payments by group cheques to pensioners in institutions, or benevolent homes.

3.13 The Department also acts as the paying agent for cash payments to individuals which are the responsibility of other Departments. These include Commonwealth Superannuation and employment and training allowances administered by the Department of Employment and Youth Affairs. These total some $530 million and cover about 85,000 persons.

3.14 The objectives in the administration of the Income Security programs are:

- to ensure that beneficiaries receive their correct entitlement; and
- to ensure continuity and timeliness of payment in all circumstances.

Subsidies

3.15 The Department administers subsidy programs, through which funds are made available for services provided by State and local governments and many community organisations. These include payments in respect of aged persons' homes and hostels, child care projects and programs, handicapped and homeless persons' projects and programs and voluntary welfare co-ordinating organisations. These subsidies presently run at some $200 million per annum.

Personal Services

3.16 Departmental functions in the area of personal services cover the provision of rehabilitation services and social work services to individuals. The rehabilitation services cost some $24 million per annum and cover about 5,500 recipients. There are also specialised units within the Department concerned with the needs of Aboriginals and migrants.

3.17 The objectives in administering the Personal Services programs are to:

- identify disadvantaged persons and groups and their needs;
- provide assistance, consistent with resource contraints;
- liaise with other organisations to allow co-ordination of services;
- monitor the effectiveness of services provided;
- administer the programs efficiently.

3.18 The Commonwealth Rehabilitation Service, with a staff of approximately 1,000, provides services for handicapped people in metropolitan and regional centres throughout Australia. In addition the Commonwealth Rehabilitation Service has a major role in co-ordinating rehabilitation services in the community environment and integrating with other relevant services to ensure maximum accessibility for handicapped people.

3.19 The Department employs approximately 300 social workers who provide personal services to clients from most Regional Offices throughout Australia and who also work with community groups to assist needy people. Specifically a social worker is responsible for:

- monitoring all aspects of the Department's public contact activities in regional offices;
- developing and monitoring co-operative links in the region between the Department and other Government and voluntary welfare agencies in the community;
- co-ordinating the work of various agencies in the community involved in making emergency relief payments for people in financial hardship;
- assisting regional mangers to oversight various projects in the region which are being provided wholly or substantially out of public monies through the Department's subsidy programs; and
- acting as outposts for the Commonwealth Rehabilitation Service.

Management Services

3.20 The Department employs almost 18 000 staff located in Central Office in Canberra, six State Headquarters, two Regional Directorates and 200 Regional Offices throughout Australia (including many in remote regions) and at Rehabilitation and Training Centres. These services cover all Departmental systems for delivering the programs and for managing Departmental resources (including staff, accommodation, equipment and funds) to achieve the aims of the programs.

3.21 A number of areas in the Management Services domain have been identified as requiring ADP support. These areas are:

- Personnel and Establishments - responsible for the control of personnel and establishment information for the Department;
- Finance/Estimates - the estimation of future expenditure and the control of actual and committed expenditure both at the State and National level;
- Inventory/Assets/Stores - the acquisition, storage and distribution of non-consumables (assets) and consumable (stores) items for Departmental locations;
- Project Control - the control of projects and activities which are occurring throughout the Department;
- Text Services - the production, manipulation, control of the access to textual information used by the Department;
- Training - the training of the Department's widely distributed staff both during the planned period of substantial technological change and as an ongoing activity; and
- Statistics/Ad Hoc Analysis - analysis of client based information for presentation to Parliament, the Department or other bodies and to identify cases and causes of incorrect benefit payments.

ADP Systems (pre-Stratplan)

3.22 ADP systems within the Department are heavily oriented towards the Income Security function. Some developments have been made towards supporting other functional areas.

Income Security

3.23 The Department has developed computer systems to support each of its three main Income Security support programs (Pensions, Family Allowances and Unemployment and Sickness Benefits). These systems are serviced by a common Payments System and minor sub-systems which extract management, clerical support and statistical information to aid in the management, operations and forward planning functions of the Department.

3.24 These Applications Systems are run at the Department's State computer centres and are used to generate payments, maintain payments information, accept changes to data required to determine payments status, generate reviews and correspondence, and to generate liaison advices between systems. These Applications Systems are governed by legislation regarding entitlement to cash payments and health care benefits. This legislation is subject to relatively frequent change.

3.25 An indication of the workload handled by these applications is given by the number of payments made:

- Pensions 52 000 000/year
- Family Allowances 27 000 000/year
- Unemployment, Sickness and Special Benefits 7 500 000/year.

3.26 Each of these systems has been developed independently and they are of varying age. The Department recognises that the following deficiencies exist:

- individual programs are large and complex;
- the programs are difficult to maintain and change;
- there is no standardisation of data between the system and no direct communication between them; and
- the current systems are batch sequential systems, which inhibits the retrieval of information to resolve client enquiries.

3.27 In addition to the major applications already identified, there are a number of other Systems. These are:

- Disadvantaged Persons System - issue of Health Care Cards;
- Domiciliary and Nursing Care;

- Tuberculosis Allowance;
- National Employment and Training Scheme; and
- Defence Force Retirement and Death Benefit - from the associated pensions and superannuation output datasets, Central Office once a year divides its information into State files for analysis at each State Computer Centre.

Subsidies

3.28 A basic ADP system has been developed to monitor subsidies programs. This system is run at CSIRO Canberra, with access provided from all State Headquarters via leased transmission lines.

Personal Services

3.29 No substantial ADP support is currently provided to the *Personal Services functional area.*

Management Services

3.30 Some computing support is currently provided to the Management Services functional areas in the form of:

- a pilot on-line personnel system run at CSIRO Canberra, with access from Central Office and all State Headquarters;
- small word processing installations in all State Headquarters other than Darwin;
- maintenance of a significant number of benefits systems manuals and other documents at CSIRO, Canberra; and
- provisions of stand-alone micro-computers for minor applications and word processing activities.

Hardware and Software (Pre-Stratplan)

3.31 Major applications production processing is performed at six State centres, located in Sydney, Melbourne, Brisbane, Adelaide, Perth and Hobart. Sydney and Melbourne are each equipped with one National Semiconductor AS3000N computer, and Perth, Brisbane and Adelaide each with an IBM 370/145 computer. Hobart has a system based on an MDS 2408 minicomputer for processing unemployment and sickness benefits and uses transmission facilities to enable the processing of other applications at the Melbourne State Computer Centre.

3.32 Each State has a communications facility based at the State Centre. The primary function of the communications facility is data entry, although some remote printing is performed at larger Regional Installations. Data entry is performed through Information Electronics 790-200 Series visual display units located in State centres and in most regional offices. These are connected to MDS 2408 minicomputers where simple format and field checks are performed on the input data. The majority of the MDS 2408 minicomputers are located in the State centres. Others are located in major country towns. Data from the MDS 2408 minicomputer is concentrated on dual Honeywell 716 minicomputers in Brisbane, Sydney, Melbourne and Adelaide. From the H716s, the transactions are transferred to the mainframes via magnetic tape. In Perth, where there is no H716, the data are transferred directly to the mainframe from the MDS 2408 via magnetic tape. The input data are edited during processing on the mainframe.

3.33 Application program development is performed in Canberra using a FACOM M190 computer operated by the CSIRO. Operating system development is carried out both in Canberra on the M190 and in each State by visiting Central Office programmers. Program development for the Network systems is carried out in Canberra. The Department has two MDS 2408 minicomputers for data entry maintenance, and access to the Department of Health's H716 Systems for the data concentration system maintenance. Programming for the latter is in assembly language.

3.34 All application systems were developed in-house and are virtually all written in COBOL. Some frequently used routines are written in IBM ASSEMBLER. Masterfiles are tape-based necessitating a sequential access philosophy. Program changes are made via magnetic tape sent from Canberra to State centres.

3.35 All programs are run under IBM operating system OS/VSI in the States and OSIV/F4 at CSIRO. The Department uses a number of utility programs, some developed in-house and some acquired commercially. Some pilot systems have been developed using ADABAS.

3.36 The Department installed interstate transmission links from Canberra to each State Capital city to provide on-line access to the FACOM M190. The communications facility consists of two 2400 bps tranmission links using IBM BSC protocol. Both are multidropped links; the first connects Sydney and Brisbane to Canberra and the second connects Melbourne, Hobart, Adelaide and Perth to Canberra. Each State Installation uses Raytheon equipment; a 1018R2 terminal controller, two 4013-13 visual display units and a 3472-02 matrix printer.

3.37 Word processing functions are mainly based on Jacquard equipment. Central Office facilities comprise seventeen keystations, several printers and 96 megabytes of hard disk storage. All State Headquarters with the exception of the Darwin Office operate small word processing installations. A number of benefits systems manuals and other documents are maintained on the mainframe computer at CSIRO in Canberra.

3.38 The Department has also acquired a number of Tandy TRS80 Model II microcomputers. These are used in the ADP Branch and the Development Division in Central Office and at the Darwin Directorate.

CHAPTER 4

STRATPLAN

Future ADP Systems

4.1 The Department is in the process of diversifying the range of computing services available to departmental staff and redeveloping their present systems to use data management techniques based on on-line processing. This includes the widespread use of integrated text procesing facilities (namely word processing, electronic mail and text reference capabilities).

4.2 ADP support is to be provided to the various functional areas of the Department, including:

- National Index;
- Income Security;
- Subsidies;
- Personal Services;
- Commonwealth Rehabilitation Services;
- Management Services; and
- Text Processing/Office Automation.

National Index

4.3 The National Index is a new facility with the principal objective of building an information base of client details which can be used to service the needs of the Income Security Systems by providing information to:

- validate new claims for benefit;
- detect and prevent incorrect or fraudulent claims and payments;
- facilitate interstate transfer of data base records thus preventing multiple payment of the same benefit and facilitating payment at the correct location;
- locate benefit reference numbers and other particulars of clients at one place; and

- aid research, planning and the assessment of the national impact of policies and administrative decisions.

4.4 The National Index processing will be performed both at the National and Divisional Installations. National Installation processing will consist of the maintenance of an Australia-wide Index which supports on-line access from User Installations at any location. Divisional Installation processing will consist of the maintenance of an appropriate sub-set of the Australia-wide Index with on-line access available to User Installations within the same State.

4.5 The National Index will be updated by transactions emanating from Income Security systems carried out at Divisional Installations. It is anticipated that, at least initially, this updating will be performed in a batch-mode with the communications facilities being used to transmit transactions to and from the National Installation.

Income Security

4.6 The major Income Security applications are:

- Pension payments which are made on a given day each fortnight. Before the pay-day the entire Pensions data base is searched and payment transactions extracted and sequentially processed by a Payments system to produce appropriate payment advices (cheques, magnetic tape entries, etc);

- Family Allowances payments which are made monthly with half the client population being paid each half-month. Because of the monthly payment cycle for Family Allowances they may coincide with payments made for other Pensions systems; and

- National Benefits System payments which are made fortnightly to individual clients with approximately 10% of the payments made each working day of the fortnight.

4.7 The Income Security data bases will be maintained at the Divisional Installations. These data bases will contain the records of clients registered for benefits within the State. The integration of existing file structures which service the three current Income Security applications (Pensions, Family Allowances and National Benefits System), will be progressively introduced as the data bases are extended to support the steady transition from batch to on-line processing. This integration of client records will be on a State, but not a national basis,

with exception that the National Index (containing client name and address) will be an aggregation of parts of the State records.

4.8 The Benefits data will be maintained and accessed by staff located in the Regional Offices. This maintenance and access will be performed on-line with, in most cases, the staff being advised almost immediately of the result of any processing action which they have initiated. Two types of data base updating actions have been identified:

- on-line updating transactions, of which there are two types:
  - updating transactions which can be applied to the data bases immediately the information is presented to the regional office staff either over the counter or by telephone. These types of transactions will not have to be authorised by another officer; and
  - payment or assessment related transactions which result from a two stage on-line process. The assessing officer will enter the claim details and carry out the initial assessment and then refer the transaction to the determining officer. Some time later (minutes or hours) the determining officer will authorise the transaction and the data bases will be updated. These transactions may generate a batch payment transaction.
- Batch transactions.

4.9 Both of these transactions are primarily those which result from the return of stimulus and review advices. The processing of these transactions would be performed before any batch payment processing is commenced.

4.10 An on-line enquiry service will be used to access information contained in Income Security data bases. Enquiries may be made against data maintained in any State. Interstate enquiries may be made by an application program at a Divisional Installation, sending a transaction to the National Installation, which may then reroute the enquiry to the appropriate interstate Divisional Installation, according to the information held in the National Index.

4.11 Outputs from Income Security application systems will be either printed at the Divisional Installation or transmitted to the User Installations in the Regional Offices. In the former category are those outputs which are voluminous. These may be printed or put onto microfiche. The output for the User

Installations will be transmitted via the communication facilities and produced using the printing facilities to be provided at the User Installations.

4.12 All payments initiated by the Income Security system are generated by a stand-alone payments system. This payments system will comprise two sub-systems, one which will run on-line, and one which will run in batch mode. The necessity for two systems arises because of the special procedures required for the on-line production and printing of cheques.

4.13 The on-line payment system will take urgent payment transactions generated by the Income Security systems, (ie counter payments such as the replacement of lost or stolen cheques) process these transactions, updating the Income Security data bases, then print the cheques and reconciliation/audit reports in the regional office. It will also generate the appropriate reports for State Headquarters.

4.14 There is a demand for this one-off cheque production and issue of immediate payments in Regional Offices. Occasionally larger numbers of emergency payments need to be made in situations where normal bulk production operations are impaired. In such circumstances details of the cheques produced on the letter quality printer will be recorded.

4.15 The batch payment system updates the Income Security data bases, prints cheques and reconciliation/audit reports at State Headquarters, and generates the cheque issue lists and reports for transmission to, and printing at, User Installations.

Subsidies

4.16 In order to administer the Subsidies programs an ADP system will be developed which will contain details of subsidy programs administered by the Department, subsidy proposals received or under consideration and relevant demographic, economic and social services information. Subsidies data bases will support these systems.

4.17 The Subsidies system will be run at the National Installation with on-line access for enquiry and file updating available from State Headquarters and Central Office. Processing and management reports will be produced at State Headquarters.

Personal Services

4.18 Specific ADP support will be provided to the Commonwealth Rehabilitation Service and Social Welfare areas. In addition social workers will require access to other ADP services, namely:

- Income Security information;
- the universally available text processing facilities, particularly the proposed text reference libraries. Data on welfare policy and precedents will be required on-line for social worker access;
- statistical analysis packages for management staff at State and Central Office;
- the User Installation printing for reports generated by the Social Welfare system;
- the Departmental Stores/Assets system. This system would also be used for control of catering at residential Rehabilitation centres; and
- use of equipment as client training aids. Word processing training and development of general VDU keyboard skills is expected to assist some clients in work preparation/adjustment centres.

Commonwealth Rehabilitation Service

4.19 To administer this organisation a range of ADP applications are planned. The requirements are:

- an information base to record profiles of clients referred, accepted and undergoing treatment;
- scheduling of treatment periods in the day to ensure consecutive tasks undertaken by the client are appropriate. Optimum use of sessional and permanent professional staff is necessary;
- integration with other services offered by the Department, such as automatic referrals from the Income Security or Social Welfare systems;
- personnel functions. Rehabilitation centres perform some staff functions outside normal public service employment, including the payment of salaries to sessional doctors and other professional staff and the employment of certain casual staff;
- payment of Rehabilitation Training and Incentive Allowances;
- management statistics to monitor the effectiveness of client treatment, professional services and financial expenditure; and

- statistical analysis of current and historical information for research and planning.

4.20 The application systems developed to support the Commonwealth Rehabilitation Service (CRS) are expected to contain information relating to client treatment and details of sessional and permanent staff employed by CRS centres. These data will be accessed on-line for updating, enquiries and report generation. Enquiry and report generation access will mainly be from the CRS centres. However, restricted access from users in State Headquarters and Central Office will be allowed.

4.21 Some batch processing access will enable automatic referrals generated by other systems to be applied. Statistical analysis programs will be initiated from State Headquarters and Central Office.

4.22 Outputs will include enquiry responses and printed reports. The enquiry responses will be formatted for VDU screen display. Reports of management summaries, treatment schedules, etc., will be transmitted to the CRS centres for printing.

Social Welfare

4.23 The major new ADP applications required by the Social Welfare function include:

- an information base to record details of clients assisted, referred to other organisations and referred by organisations (eg the Commonwealth Rehabilitation Service) for follow-up support;
- scheduling of planned work for future periods; such agencies to be seen during the next month, etc;
- a directory of available social welfare organisations, already exists in some States and will be enhanced; and
- management statistics to provide information on welfare organisations, already exists in some States and will be enhanced; and
- management statistics to provide information on welfare services provided and staff effectiveness. This will allow more flexibility in response to changing requirements.

4.24 The application systems developed to support the social welfare area are expected to contain information relating to client case histories and a directory of social welfare organisations, resources and services.

4.25 These data will be accessed on-line by officers in User Installations. The Social Welfare client data will be updated by the regional office social worker providing the assistance. Statistical analyses will be required by State Headquarters and Central Office. The directory will generally be updated following an annual survey of welfare agencies although minor adjustments will be made by regional office social workers.

4.26 Outputs from on-line processing will mainly be responses displayed on the screen from which the access was initiated. Some reports will be printed at each regional office to provide volume statistics and work schedules.

Management Services

4.27 Management Services covers all levels of administration and management in the Department. A need has been identified to greatly increase the level of ADP support and thus indirectly to the other functional areas identified previously.

4.28 The form of this support covers:

- the provision of text reference, text processing and automated office facilities to all Departmental staff; and
- the provision of specific data processing systems to meet specific requirements in the various operational units.

4.29 The Department envisages an environment in which there is a high level of integration of text processing and office automation facilities in the operating environment of all user installations. These facilities will include:

- word processing facilities which will be used to create and manipulate text for distribution both inside and outside the Department. It is intended that these facilities be able to exchange information with applications systems;
- electronic mail capabilities to allow the transfer of text between any two Departmental Installations; and
- automated office facilities to assist in the operation and management of offices.

4.30 Text reference libraries will be established to allow on-line access from all user installations to libraries of text recovering such things as operations manuals, records of appeals and administrative decisions.

4.31 The following specific applications have been identified in the Management Services area:

- Personnel and Establishments - a system to provide management with up-to-date information on all personnel and establishments matters. The system will be run at the National Installation with on-line updating available to Central Office and State Headquarters. Restricted on-line enquiry access will be available from all User Installations;

- Manpower Planning/Office Planning - a system to provide management with information on manpower resources, workflows and productivity. The system will extract real-time information on the workflow within an on-line system and the system performance parameters affecting that workflow. Analysis of trends will also be performed requiring the storage of historical data. The bulk of the raw data for the system will be generated as a by-product of other processing and will be updated in a batch mode. Ad hoc on-line enquiries against this system can originate from all levels of the Department;

- Finance/Estimates - a system to assist in the control of budget allocations and outstanding commitments, to project cash flows, to assist in the preparation of estimates and to provide greater control over funds transfer. This system will run at the National Installation with update and enquiry actions originating from State Headquarters and Central Office;

- Project Control - a system to schedule activities including manpower scheduling, cost breakdowns and identification of the status of activities. Access to this system will be primarily from Central Office and State Headquarters although there may be some demand from regional offices;

- Inventory/Assets/Stores - a system to provide control and co-ordination of all ordering, purchasing and distribution of items. Access to this system will primarily be from State Headquarters and Central Office;

- Statistics/Ad Hoc Analysis - a service to allow analysis of data held or collected by the Department. Data collected will be entered at State Headquarters and Central Office and will be processed at the National Installation. Frequent statistical analysis runs will be initiated against these data at the National

Installation. Fast batch turnaround will be required for this work. Divisional Installations will infrequently be required to process ad hoc statistical analyses initiated from Central Office. Graphics plotters and display terminals will be needed for the production and presentation of statistical reports. Microfiche may be used for archived data; and

- Training - a service to support the training of the Department's widely distributed staff - will be available via VDU terminals and will be used extensively to familiarise staff with new equipment and systems.

Stratplan Implementation

4.32 The essential elements of STRATPLAN are:

- a total re-equipment of all the Department's computer systems;
- application of computer technologies new to the Department, including areas not currently supported by ADP;
- integration of technologies such as word processing, electronic mail and office automation into computerised program administration;
- application of these integrated technologies to all locations in the Department; and
- linkage of all Departmental locations electronically for rapid transfer of information.

4.33 The following facilities were requested in the Department's tender for equipment to be available in both State and Regional Offices:

- data entry - to allow the input of new claims for benefits, changes of addresses and other information needed by the Department to make payments. This information is included in the computer maintained files used to produce the payments. The new facilities will replace existing data entry facilities;
- on-line enquiry and updating of client information - authorised officers will be able to access directly and update the information used by the Department to make payments to

beneficiaries. This will permit them to answer queries from beneficiaries quickly, and to record information from new beneficiaries, thereby ensuring the earliest provision of the correct payments;

- printing of computer output from overnight computer processing will be delivered with minimum delay to the staff who need the information. Printers will be provided in regional offices;

- word processing facilities - letters to clients advising changes in benefits, notifying times for interview or medical appointments, and answering queries will be produced using word processing facilities rather than typewriters;

- electronic mail - for internal reports, requests for information, and especially speedy transfer of client information between Departmental locations throughout Australia;

- reference to manuals, etc - this facility, termed text reference, will allow regional office staff to reference the latest versions of the legislation and regulations governing the eligibility of people for payments, etc. This text will be held on computer files; and

- automated office facilities - to assist in the smoother running of the clerical office environments. These facilities include calendar and appointment management, mathematical spread sheet calculators, message administration, etc.

4.34 Many of these facilities will also be used in Central Office and State headquarters locations of the Department and at Commonwealth Rehabilitation Service centres. The office facilities such as word processing and electronic mail will be used in all centres, with the Commonwealth Rehabilitation Service centres also using the facilities for training purposes.

Timetable for Stratplan Implementation

4.35 The National Computer Centre at Deakin, ACT and the NSW State Office in Sydney are now fully equipped with computers. The order of installation for the other States and Regional Directorates is Queensland, Tasmania, Victoria, South Australia, Northern Territory and Western Australia, over a period of 2.5 years.

4.36 The first Regional Office in NSW to go 'live' was scheduled for March 1984 but it appears that it will be delayed by nine months due mainly to industrial issues but also due to some technical difficulties in implementing the system.

4.37 The first major system to be available will be on-line enquiry - the ability to use a visual display unit (VDU) to look at the information held on the computer data-base. This facility will involve the use of some 7000 VDUs in the Department around Australia when Stratplan is fully implemented.

4.38 On-line update, the facility to change the computer record, is scheduled for implementation by December 1985. It would appear on information available to the Committee that this will be at least twelve months late.

Equipment and Software to be Supplied

4.39 The following is the list of equipment expected to be acquired over the four year implementation period of Stratplan. This list was agreed to in June 1983 and while there have been some changes in type and volume, it would appear that the cost has not altered.

Successful Contractors and Equipment		Estimated Cost
Amdahl		$24 200 000
7	580 series central processing units	
18	front-end processors	
64	main storage units	
17	memory expansion units	
34	channel adaptors	
41	communications scanners	
84	line interface bases	
259	line sets	
18	remote program loaders	
6	expansion frames	
	software for 7 sites	
Storage Technology of Australia Limited		$14 900 000
22	cache DASD controllers	
57	634MB disc modules	
42	2.5GB disc modules	
10	solid state modules	
49	6250bpi tape drivers	
20	documentation printers (1500 and 3000 series)	
7	automatic tape libraries	

Wang Computer Pty Limited		$62 600 000
445	VS miniprocessors	
52	640MB disc drives	
7266	colour workstations	
1475	general purpose/letter quality printers, associated operating systems, peripheral controllers, etc. software to provide the functions of word processing, data entry, printing, on-line access, etc.	
Raytheon		$ 700 000
91	colour terminals with tilt swivel option	
15	terminal cluster controllers	
3	graphics printers	
Memorex Pty Limited		$ 300 000
3	graphics colour terminals	
1	terminal cluster controller	
3	graphics printers	
Quest Automation Pty Limited		$ 10 000
6	signature verification devices for pilot installation	
Tektronix Australia Pty Limited		$ 200 000
	colour terminals plus colour output devices	
	mainframe based software	
Techway		$ 30 000
	mainframe based graphics software for pilot installation	
Systems Technology Pty Limited		$ 40 000
4	communications interface devices	
IBM Australia Limited		$ 1 600 000
	MVS and related software for 7 sites	
	VM/SP operating system for 1 site	
	programmer productivity aids for 7 sites	
	front end processor operating software	
	problem determination and resolution aids for 7 sites	
	text reference library for 7 sites	
	teleprocessing monitors for 7 sites	

Boole and Babbage Australia Pty Limited $ 900 000

system performance monitoring and reporting software for 7 sites
system performance modelling software for for 1 site
on-line performance troubleshooting software for 7 sites
programmer productivity aids for 7 sites
high performance TSO equivalent for 7 sites
system resource accounting software for 7 sites

BH Consultants Pty Limited $ 100 000

hardware reliability reporting software for 7 sites

SKK Systems Software & Consulting Pty Limited $ 200 000

mainframe security software for 7 sites

Computer Sciences of Australia $ 300 000

production control software for 7 sites

Computer Power $ 1 800 000

data management software comprising:
database management system Model 204 (produced by the Computer Corporation of America) for 7 sites
data dictionary for 1 site
query/Development facility for 7 sites

Datacraft (Australia) Pty Limited $ 1 800 000

miscellaneous communications equipment

Conclusions and Recommendation

4.40 The Committee has concluded that Stratplan does not improve the quality of the information regarding clients of the Department but it makes this information easier and quicker to change and retrieve.

4.41 No new technologies have been developed for Stratplan. It is not technically complex but because of its size it is difficult to manage. The complexity of the project has been largely created by the Department's decision to centralize its information base and to access this base via up to 7000 on-line terminals.

4.42 While the Australian computer industry has benefitted by the Department's extensive use of contractors and some program aids, the Committee believes that the tender should have placed greater emphasis on Australian products.

4.43 Since the announcement of Stratplan the Committee notes that the Department has been successful in the following areas of activity:

- the installation of equipment in the new National Computer Centre and in the State Centre in Sydney both of which required substantial alterations to buildings;
- the training of thousands of its staff including the production of three video training films;
- the promotion of a general acceptance of Stratplan by staff at all levels;
- the initiation of automated systems and project management methodologies;
- the recruitment of new staff and contractors;
- the formulation of procedures for the efficient purchasing of Stratplan equipment, engagement of contractors, budgeting and estimating; and
- the research and documentation of security systems and the draft Contingency Plan.

4.44 The Committee notes that the first regional office appears to have been delayed by nine months due to industrial issues and technical difficulties and that the facility for on-line update will be at least twelve months late.

4.45 The Committee notes that the contingency plans to minimise the effects of equipment failure by providing a system of back-up between installations has not proceeded beyond the draft stage. The Committee recommends that:

1. The Contingency Plan be completed and tested and the Committee informed of the results before the implementation of the Queensland phase is completed.

CHAPTER 5

ACQUISITION PROCESS

Structure of Acquisition Process

5.1 Several steps were followed in the acquisition process for computer systems for Stratplan and these conformed with Commonwealth acquisition procedures. The major steps with target and actual schedules were as follows:

	Target schedule	Actual schedule
Survey of user requirements	Aug-Dec 80	Aug-Dec 80
Preparation of Strategic Plan	Jan-Aug 81	Jan-Aug 81
Review of Strategic Plan	Sept-Oct 81	Sept-Oct 81
Submission to Cabinet of Strategic Plan	Nov-Dec 81	Nov-Dec 81
Preparation of Request for Tender documents	Nov 81-Mar 82	Nov 81-Mar 82
Invitation of public tenders	Apr-June 82	Apr-July 82
Evaluation of tenders	July-Dec 82	Aug 82-May 83
Cabinet approval of recommendations	Jan 83	June 83

5.2 Three other processes were carried out in parallel with this acquisition process. These were as follows:

- Database design;
- Network design; and
- Preparation of contract structure.

User Survey

5.3 A survey of user requirements commenced in August 1980. A small number of officers spent some four months on this task to investigate the requirements of all existing data processing users throughout the Department and to investigate the requirements of areas which were not then using data processing but which might conceivably have an application. This included areas involved in policy development, legislation and preparation of operational instructions.

Preparation of Strategic Plan

5.4 The survey of user requirements was used as the basis for preparation of a strategic plan for data processing throughout the Department. Work on the Strategic Plan commenced in January 1981. For this purpose a team of three was established reporting to the head of the ADP Branch, with others contributing to the investigation of particular aspects.

5.5 To direct the preparation of the Strategic Plan a committee entitled Stratcom was established. It comprised a Deputy Director-General, the head of the ADP Branch, the head of the Systems and Operations Division, and the State Directors from New South Wales, Victoria and Queensland. The Committee provided high level priority setting and goals. Work on the Strategic Plan itself was carried out under the direct control of the head of the ADP Branch.

5.6 The Public Service Board (PSB) was invited to participate in the development of the Strategic Plan and draft papers were sent to the Board for comment. The Board was also invited to meetings of Stratcom and sent observers for this purpose.

5.7 Preparation of the basic draft of the Strategic Plan took place over the period January to August 1981. In August 1981 Stratcom approved the basic draft of the Strategic Plan following consideration by the Public Service Board, the Department of Administrative Services and the Department of Finance. This was circulated to senior officers of the Department for discussion and review.

Review of Strategic Plan

5.8 Over the period September to October 1981, the Department invited competitive tenders for consulting firms to review the Strategic Plan and W.D. Scott was chosen.

5.9 Following this review, the consulting firm submitted recommendations as to how the Strategic Plan should be modified in order to meet Departmental objectives. These recommendations were accepted by the Department and the Strategic Plan modified accordingly.

Submission of Strategic Plan to Cabinet

5.10 The modified Strategic Plan was approved by the Director-General and endorsed by the Minister for Social Security who indicated that it should be put to Cabinet.

5.11 The Strategic Plan was put to Cabinet and approved in December 1981. Possible staff savings of between 2400 and 2700 were quoted as being realistic. As part of the Cabinet consideration the Strategic Plan was considered by several departments including the Public Service Board, the Department of Administrative Services, the Department of Housing and Construction, the Department of Finance, and the CSIRO.

Preparation of Request for Tender Documents

5.12 Work commenced on preparation of Request for Tender documents in November 1981. Two basic Request for Tender documents were prepared, one for data management software and one for hardware, systems software and the communications network.

5.13 To assist in the preparation of Request for Tender documents two sets of consulting personnel were retained to assist the Department. One set was general data processing consultants to ensure that the overall documents would result in the provision of facilities to implement the Strategic Plan.

5.14 General data processing personnel were from W.D. Scott and Disc International. They assisted in the overall preparation of the Request for Tender document in terms of consistency, cohesion and equity. The other set of specialist personnel assisted in the areas of data management software, communications and network requirements.

5.15 Tender documents were also drawn up with input from the Department of Administrative Services to ensure that the Request for Tender documents were consistent with the Department of Administrative Services' requirements. Input was also obtained from the Offsets Secretariat located in the Department of Defence Support.

5.16 In parallel with the process of preparation of tender documents, work was also commenced on the development of a detailed tender evaluation methodology. This was carried out in consultation with both the general and specialist consultants and the Department of Administrative Services.

5.17 A set of procedures for dealing with tenderers during the period in which tenders were to be open was also drawn up.

Invitation of Public Tenders

5.18 Public invitations were requested with the publication of the request for tender documents. Two documents were issued in April 1982, one for data management software and one for hardware and systems software. Tenders for the data management software were requested within two months of invitation of tenders. Tenders for hardware and systems software were requested within three months of invitation of tenders.

5.19 During the period in which tenders were being invited, formal presentations were arranged. Each tenderer was allowed to provide one major presentation. Further presentations were at the specific invitation of the Department where specific queries recorded were put to tenderers by the Department. All meetings were tape recorded, all queries were in writing and all information submitted by tenderers in response to these queries was also in writing.

5.20 During this time, work was set in hand to organise tender responses and evaluation. This required preparation of procedures covering the acquisition of tender documents, cataloguing, security, structure of tender evaluation teams, the precise steps of the evaluation process itself, the means by which Departmental evaluations would be catalogued, collated and assessed, and the means by which these assessments would be put to management.

5.21 During this process, arrangements were made to set up a high level interdepartmental steering committee governing the Stratplan evaluation process. This steering committee was chaired by the Department of Administrative Services and included representatives from the Department of Social Security, the Commonwealth Employment Service, the Department of Defence, the Public Service Board, the Department of Science and Technology and the Offsets Secretariat.

5.22 The Department of Administrative Services also commenced the process of acquiting expert independent advice to assist it in its role. This involved inviting proposals for the retention of a consulting firm to act as independent assessor to the evaluation. This role was to involve the consulting firm acting as a full-time auditor working within the Department of Social Security to oversee all aspects of the evaluation. The independent assessor reported directly to the Department of Administrative Services and not to the Department of Social Security. Logica Pty Ltd was retained as independent assessors during this period. They also were represented on the Steering Committee.

5.23 The Department also retained its own consultants to assist in evaluating tenders. While the Department established evaluation teams of permanent officers to do the detailed work, the consultants, from Coopers and Lybrand and Urwick

International, assisted in an overseeing role together with the First Assistant Director-General of the Strategic Planning and Development Group, who was responsible for the overall evaluation process itself.

5.24 During this period of tender invitation the precise tender evaluation methodology was considered in detail by all parties and finalised.

Evaluation of Tenders

5.25 Tenders for data management software closed in June 1982. Tenders for hardware and systems software closed in July 1982.

5.26 The tender evaluation proceeded according to the previously established evaluation methodology. Detailed work carried out by evaluation teams was oversighted by the First Assistant Director-General, Strategic Planning and Development Group, and reviewed by the consultants retained from Coopers and Lybrand and Urwicks. Input was made in the database and communications areas from other specialised consultants.

5.27 Recommendations by the tender evaluation team were reviewed by its consultants and by the First Assistant Director-General, Strategic Planning and Development Group, and incorporated into reports to the Stratplan Implementation Committee. These were considered by it and, once approved, were put to the Department of Administrative Services. The Department of Administrative Services in turn reviewed these recommendations with input from the independent assessors.

5.28 Where any recommendations made by the Department were questioned by the Department of Administrative Services and/or the independent assessor, these were sent back to the Department for review and appropriate modifications were made - either immediately or after discussion with the independent assessors and the Department of Administrative Services. Meetings were held monthly with the Stratplan Implementation Committee for this purpose. At various points throughout the evaluation process, high level meetings of the Steering Committee, chaired by the Department of Administrative Services, were held. These meetings considered outstanding issues and the process of the evaluation itself.

5.29 As a result of this process a short list of tenderers was drawn up offering two possible solutions. These solutions were agreed to by departmental management and by the Steering Committee by late December 1982.

5.30 Vendors who had components in the short listed solutions were informed of this fact in confidence in late December 1982. It was indicated to them that the next phase of the tender evaluation would be the establishment of integration

tests at a site most suitable to them. This would bring together all elements of the solution of which they formed a part in order to test the viability and performance of all tendered items.

5.31 Integration tests incorporating all short listed components were arranged in California and took place between February and March 1983. For this purpose technical teams were sent to California to assist in the establishment, conduct and monitoring of these tests.

5.32 In parallel, a management team comprising representatives from the Department of Social Security and the Department of Administrative Services went to the United States and Japan in February/March 1983. Their purpose was to hold discussions with vendor managements, to inspect reference sites and to monitor the results of the integration tests.

5.33 Integration tests and management visits were completed by the end of March 1983. Results of these tests and visits were integrated into the evaluation carried out by the tender evaluation teams. Final recommendations were prepared by the end of April 1983. These recommendations were approved by the Department of Social Security management and the Steering Committee chaired by the Department of Administrative Services.

Cabinet Approval of Recommendations

5.34 Following this process a submission was put to Cabinet in May 1983. This provided the Department's recommendations on choices following the evaluation of tenders. It also included a assessment of the total costs of Stratplan but did not include figures relating to staff savings. In early June 1983 the submission was approved by Cabinet.

Database and Network Design

5.35 In the case of database design, work was commenced in June 1981, before preparation of Requests for Tenders or finalisation of the Strategic Plan.

5.36 Work on communications and network design commenced in late 1981 before the evaluation of tenders.

5.37 As part of the communications and network design process, a full time consultant from Telecom was retained before tenders were received. This allowed all communications and network design to conform with Telecom network considerations.

Contracts Development

5.38 Work on contracts development was commenced in mid 1982, while tenders were being invited. Work was then carried out in parallel with evaluation of tenders.

Conclusions

5.39 On the evidence placed before it, the Committee has concluded that:

- there was extensive use of independent advisers in all stages of the process from the original review of the Strategic Plan to the final tender evaluation;
- there has been appropriate top level commitment to the project from within the Department;
- the Public Service Board and other regulatory agencies contributed to the process as did the Offsets Secretariat, the Departments of Administrative Services, Housing and Construction and Industry and Commerce; and
- except that officers who would later use the system were not consulted in its design, the Department's acquisition process followed the guidelines laid down by the appropriate authorities. The aspect of staff involvement is discussed in Chapter 7 - Industrial Relations.

CHAPTER 6

HEALTH AND SAFETY

6.1 The Committee regarded Health and Safety aspects of the project as very important. The Committee received submissions from Dr W Burch, the chief radiation protection officer from Royal Canberra Hospital, Ms K Liddicoat, a senior occupational therapist from the Capital Territory Health Commission, and Mr P Good, from the Administrative and Clerical Officers' Association. The subject was also discussed with Dr R Scott from the Department of Health and with Department of Social Security officers.

6.2 The matters that were considered in detail related to possible radiation emission problems, eyesight testing and general occupational health. As stated later in Chapter 7, the Australian Public Service Association and the Administrative and Clerical Officers' Association (ACOA) have insisted on both eye tests and checks of equipment safety that are not usual in the Public Service in Australia nor in equivalent overseas organisations.

Radiation Emission

6.3 Mr Good stated that there was a possibility of health damage caused by the emission of radiation from screen based equipment. His claim is supported by some other staff associations but there appears to be no scientific evidence to substantiate this theory. Evidence was heard from Dr W M Burch, a medical physicist, that from the point of view of health, hazards from ionizing and non-ionizing radiation emissions did not exist. However, Dr Burch spoke of the possible eye/brain link from the flickering light syndrome being caused to some operators by the use of screen based equipment. His hypothesis is supported by the Australian College of Scientists in Medicine. It was developed following an investigation of a reported spate of spontaneous miscarriages among visual display unit operators in a bank in South Australia which was originally attributed to radiation effects. At that time, Dr Burch was working with visual evoked responses and other neurophysiological aspects. It appeared that an investigation of the possible ill effects of prolonged visual stimulus by patterns of flickering light with reported unpleasant side effects from visual display units was warranted.

6.4 Dr Burch indicated to the Committee that it was a reasonable hypothesis to suppose that there is an entire spectrum of effects in a normal population due to flickering light running all the way from frank convulsions, through headaches, euphoria, depression, absenteeism, down to nothing.

6.5 Dr Burch indicated in his paper, reproduced in Appendix 7 in the volume of Appendices to this report, a suggestion to reduce or eliminate the symptoms of this disorder. However, the link remains a hypothesis and needs to be scientifically tested. Initially, the Committee indicated that it may commission a full investigation. However the Committee believes it would be most appropriate for the National Occupational Health and Safety Commission to do this work. Consequently, the Committee recommends that:

2. As a matter of urgency, the National Occupational Health and Safety Commission carry out a full investigation of the hypothesis known as visually evoked responses in photosensitive persons.

3. Staff associations be encouraged to consider Dr Burch's hypothesis and participate in any investigations.

6.6 The Committee later asked Professor Haydon, a visiting fellow to the Ion Diffusion Unit at the Australian National university, to attend a controversial seminar on the subject of radiation hazards in Melbourne which had attracted widespread media attention. His report to the Committee clearly indicates that, on the measurements carried out by the Australian Radiation Laboratories, no visual display unit was shown to emit x-radiation, none had any detectable level of microwave emission and measurements of non-ionizing radiation showed that ultra-violet and visible and infra-red emission levels measured at 10cm from the screen were many orders of magnitude below maximum permissible exposure levels defined by the Standards Association. At the normal operating position of 30cm or more, the levels would be considerably less. Professor Haydon concluded his report by indicating that the seminar failed to provide any reliable evidence to support a view that visual display unit operators are subjected to health hazards based on imbalances in the concentrations of positive and negative ions in the atmosphere caused by the operation of the visual display unit devices themselves. A copy of his report has been included in Appendix 7 in the volume of Appendices to this report.

6.7 The Department has engaged contractors who will test all its terminals for radiation emission. The Committee understands that this test will not be as accurate as that carried out by the Australian Radiation Laboratories but should show if a terminal appears to be emitting radiation. The tests are being carried out at the insistence of the ACOA which also recommended the contactor.

Eyesight Tests

6.8 The staff associations have been clear in demands that staff should be given full ophthalmological or optometric tests prior to using screen based equipment and at two yearly intervals. The National Health and Medical Research Council (NH&MRC) in their guide to screen based equipment in October 1983 stated that there is no particular need for operators to have eyesight tests any more than, or differing from, those applicable to other clerical workers. However on commencement of work with visual display units and in accord with normal occupational health practice it is desirable for operators who work consistently with visual display units to have screening tests.

6.9 Evidence to this effect was given by Dr Scott of the Department of Health who made copies of the NH&MRC Guide available to the Committee and made the following statement:

> This Guide is by definition a guide and a recommendation only, based on the best evidence available to the NH&MRC acting on advice from its Public Health Advisory Committee which in turn acts on advice from the Occupational Health (Standing) Committee...
>
> It is of interest to note that on this committee are representatives from Commonwealth and State Governments and representatives from the Confederation of Australian Industry and the Australian Council of Trade Unions.
>
> In terms of Government Employment however, under the Code of General Principles for Occupational Safety and Health in Australian Government Employment, the responsibility for Occupational Health recommendations rests with the Director-General of Health. As the present Director-General of Health is not medically qualified, this responsibility is currently vested in the Chief Commonwealth Medical Officer.
>
> Further, under Section 2.1 of this Code every chief officer shall be responsible for ensuring that the Code is followed in his department or instrumentality.
>
> This Guide was gazetted on 7 February 1984 by the Chief Commonwealth Medical Officer as a recommendation to head officers under the Code.
>
> The Director-General of Health is chairman of the NH&MRC and the Chief Commonwealth Medical Officer is a member of the Council.

> The Eyesight Tests recommended are screening tests only and not necessarily Diagnostic Tests. They are designed to screen those people who do not reach acceptable standards, and to have them referred to a consultant for further more detailed examination, and, hopefully, correction of their 'abnormality'.

6.10 Dr Scott undertook to examine the eyesight testing carried out in some overseas countries such as West Germany, Sweden, New Zealand, United States and Great Britain. The result of his research shows that the attitude of the relevant health authorities in these countries is similar to Australia, though in many countries it is not even regarded as an issue for discussion.

6.11 In interim guidelines relating to occupational health, issued on 1 January 1984, Telecom stated that:

> 'The appropriate eyesight screening tests consists of the following ocular tests:
>
> . Distance Visual Acuity;
> . New Visual Acuity;
> . Oculamotor Co-ordination;
> . Colour Vision;
> . Slit Lamp Examination of the Eye; and
> . Ophthalmoscopic Examination of the Ocular Fundus'

Occupational Health

6.12 In the Australian Public Service there are alarming and growing statistics of injuries caused by the introduction of screen based equipment. The most common injury is repetition strain injury (RSI) which usually shows up as a pain in the fingers, wrist or elbow and sometimes in the shoulder or back muscles. There may be some swelling of the joints but the occurrences of the injury, or otherwise, cannot be measured by swelling. Repetition strain injuries appear to be caused by the rate of work, amount of static muscle work and the stressful posture both of the body and particular joints.

6.13 Attachment E is a copy of a paper given by Ms Kerry Liddicoat, a senior occupational therapist from the Capital Territory Health Commission to the recent ANZAAS Conference. Ms Liddicoat, at a hearing of the Committee, discussed the psychological problems caused by medical practitioners disbelieving sufferers because no evidence of injury was obvious and the stress caused by the ignorance of both colleagues of the sufferers and society.

6.14 The Central Office of the Department of Social Security has about 100 operators of which 30 are injured at the present time. There are two civil cases awaiting hearing in Adelaide where operators are suing the Department for damages as a result of their work on terminals. In the Australian Capital Teritory a Support Group for repetitive strain injury has over 400 members from many organisations, but the real incidence of the injury is not known.

6.15 During this investigation the Committee has examined the following documents amongst others:

- Work on Visual Display Units: Risks for Health - World Health Organisation;
- Report of a Cross-Sectional Survey of VDT Users in the Baltimore Sun - Dept. of Opthomology, University of Maryland;
- Health Issues in VDT work - US Dept. of Health and Human Services;
- Human Factors Aspects of VDU Operation - Health & Safety Executive, London;
- Vision and VDU's. A Review - Australian Optometrical Association;
- An Investigation of Health Complaints and Job Stress in Video Operators - Miami University, Ohio; and
- Prevention of Occupational Eyestrain - ASTMS, London.

6.16 The theme that is obvious from these publications is that there is a difference between the eye tests required for VDU operators and other clerical workers, as most people who work on screen based equipment would maintain. In speaking about repetitive strain injuries and eye tests medical practitioners have been known to quote from the writings of Ramazzini who discussed these problems in the beginning of the 18th century. On the "Diseases of Printers" he said in about 1711:

> 'Printers themselves tell that after they have applied themselves to their task the whole day long and have left the shop they fancy even at night that those letters which are printed on their imagination keep moving to and fro for many hours. Thus from gazing all the time so fixedly at these black letters, the tonus of the membranes and fibers of the eye is seriously weakened, especially of the pupil. Those who sit at the

forms and compose may do well to wear spectacles to prevent failures of the tonus of the eye, and now and again they should rub the eyes gently; also bathe them.'

6.17 Later in writing about the problems of people who do fine work he said:

> 'it would help those workers very much if besides wearing spectacles they would give up the habit of keeping the head constantly bent and the eyes fixed; if they would now and again drop their work and turn their eyes elsewhere or snatch a respite of several hours from their task and rest their eyes by looking at a number of different things'.

6.18 His advice seems worth following today. In this area of occupational health the progress in two and a half centuries hardly equates with the enormous social and economic changes that have occurred in that time.

6.19 Because the issues of health and safety are common to all departments the Committee has produced a separate volume which contains the policies of the major staff associations and the guidelines laid down by several departments to protect the health of their staff. This volume entitled 'Occupational Health and Safety Aspects of VDU Use; Appendices to Report 225' was produced to ensure that some of these documents which have been provided to the Committee are generally available.

Conclusions and Recommendations

6.20 The Committee believes that the Department of Social Security, with the help of staff, qualified ergonomists and the Commonwealth Institute of Health, has done an excellent job in designing furniture and terminals. The Department employs one occupational health and safety officer and is attempting to change work practices so that one operator may not operate a keyboard for more than 3 or 4 hours per day.

6.21 The Committee recommends that:

> **4. The suggestion that staff should be multiskilled rather than solely keyboard operators be considered as a basic principle of employment by the Public Service Board and other appropriate bodies as a matter of urgency.**

6.22 The question of health and safety ranges across the whole of public sector employment. It is raised in the Stratplan context because of the visibility and size of this project, and the changes that are expected in the work habits of the majority

of staff in the Department. The Committee believes that the provision of better conditions in this Department will be the policies adopted for the workforce at large.

6.23 The Committee notes that if the interim measures issued by Telecom are agreed to in the Public Service they would appear to cover most of the associations' requirements. The Committee also notes that the NH&MRC is the regulatory authority, yet it issues a booklet which is 'A Guide and a Recommendation Only'. This publication was then accepted by the Public Service Board, and, in spite of its status as a recommendation only, it became the regulation under which all departments must act. The Department of Social Security cannot act independently to perform eyesight testing even though the cost of this, to them, is minimal compared to the cost of the delay in system implementation.

6.24 Another problem of setting guidelines rather than regulations seems to occur when staff associations ask for rest time for keyboard operators. Some departments insist on staff exercising morning and afternoon plus allowing 10 to 15 minutes breaks every hour, while other organisations allow neither exercise nor rest and may not be aware that repetitive strain injury is a problem.

6.25 The Committee recommends that:

5. **All health and safety problems be examined by the newly formed National Occupational Health and Safety Commission, which will take over much of the occupational health responsibilities from the Public Service Board; and**

6. **All future instructions, from any authority to the Department on health, safety and industrial issues be issued as directions not draft guidelines, guidelines, or recommendations.**

CHAPTER 7

INDUSTRIAL RELATIONS

7.1 In September 1981 the Minister for Social Security announced the Department's intention to re-equip its computer system. Since then the following discussions have taken place between the Department and representatives from the Administrative and Clerical Officers' Association (ACOA) Australian Public Service Association (APSA) and the Public Service Board (PSB).

- The first meeting with APSA and ACOA was held on 15 January 1982.

- A meeting was held with APSA on 18 February 1982 at which sections of the tender documents relating to equipment to be used by staff which have occupational safety and health implications were provided.

- A further meeting with ACOA was held on 22 February 1982. ACOA were advised of the closing times for tenders in the three broad categories of:

  - hardware and systems software;
  - data management software; and
  - contract programming.

- ACOA formally requested copies of the tender documents. ACOA offered to participate in the evaluation of equipment which had occupational safety and health implications.

- The Minister met with APSA on 10 March 1982 and ACOA on 18 March 1982.

- On 23 April 1982 ACOA/APSA were given written assurances that the growth in the Department's staff would offset any retrenchments but advised of the likelihood of redundancies and redeployments.

- On 26 January 1983 a general briefing session for all unions was held.

- On 13 April 1983 the Department wrote to ACOA/APSA seeking their involvement in occupational safety and health factors evaluation of Stratplan equipment, in particular

VDU and keyboard terminals. Involvement included inspection and assessment under appropriate conditions of confidentiality.

- On 5 May 1983 ACOA/APSA representatives viewed Stratplan equipment.

- On 12 July 1983 a further meeting was held with ACOA/APSA.

- On 28 July 1983 there was a meeting with ACOA/APSA on Regional Office Site Preparation.

- After August 1983 there were more frequent meetings with both Associations - more or less on a monthly basis.

- On 5 September 1983 the Department advised the Public Service Board of the pressures building up in the workplace over existing eyesight test guidelines for screen-based equipment operations. The Acting Assistant Director-General, Manpower and Planning stated in a memorandum to the Public Service Board:

  'This Department is seeking to provide adequate occupational safety and health training within the Stratplan training program but can do little to ease the anxiety that staff are expressing concerning the eyesight testing protocol until Service-wide steps are taken to ameliorate the situation'.

- On 12 September 1983 a staff impact study for Mission 1 products was provided to ACOA/APSA.

- Following the October 1983 meeting with ACOA no further meeting took place until 25 January 1984 because the Department was not meeting the costs of ACOA representatives who attended Stratplan meetings.

- On 25 November 1983 the Department raised its concern on eyesight testing at the Committee on Occupational Health and Safety in Australian Government Employment Management meeting. At that meeting it was agreed that the Management Group would attempt to get the ACTU to agree to technical standards.

- The Department met with APSA on 13 December 1983 and displayed a proposed work station complete with VDU and keyboard.

- On 21 December 1983 Departmental representatives met with representatives of the Public Service Board to discuss eyesight tests. The Department again pointed to its industrial situation and the implications for Stratplan implementation.

- From January 1984 the Department agreed to meet the cost of two ACOA representatives - similar provisions were extended to APSA.

- Since that time the Department has met with both Associations at frequent intervals. Stratplan consultations are now referred to a sub-committee of the respective national consultative arrangements reintroduced by the Minister in January 1984.

- On 19 January 1984, the Minister confirmed with ACOA that there would be no retrenchments arising from Stratplan. At the same time the Minister informed ACOA that compulsory transfers may be unavoidable in certain circumstances and that the Department would abide by eyesight test guidelines determined by the Public Service Board.

- On 9 March 1984 the Department forwarded to both ACOA and APSA for comment a copy of draft guidelines for redeployment in the Department. These guidelines essentially sought to achieve voluntary redeployments before the formal processes of the CE(RR) Act were invoked.

- On 13 April 1984, the Department wrote again to the Public Service Board on eyesight testing requesting the Board to look again at the Service-wide guidelines for eyesight testing.

- On 3 May 1984 the Department and the Public Service Board met with APSA to discuss the Hardware Controller classification. As a result of this meeting both the Board and the Department undertook to provide APSA with various documents relating to how the decision was reached on the level of the position. This information was provided on 11 May 1984.

- On 22 May 1984 APSA advised the Department that it was still considering the material provided and would give a response when all considerations were completed.

- On 31 May 1984 ACOA provided the Department with proposed duties for a position of Clerk Class 7 (Site Liaison Officer) which it considers essential for all regional offices.

- On 4 June 1984, the Public Service Board, ACTU, ACOA and APSA met to discuss eyesight test guidelines.

- Also on 4 June 1984, the Director-General wrote to the Chairman, Public Service Board, pointing out the occupational safety and health concerns of the staff associations in relation to Stratplan and sought leadership from the Board.

- On 6 June 1984 the Director-General wrote to the ACOA confirming the Department's position on redeployments and compulsory transfers and on eyesight tests.

- On 13 June 1984, the Department wrote to the Public Service Board seeking guidance on the issue of testing VDUs for radiation emission. The Department also outlined what action it had taken to that time. The Assistant Director-General, Manpower and Planning asked the Public Service Board for specific guidance and concluded his letter by saying:

  'The Department acknowledges the association's concerns for the health and safety of their members and will be formulating a response to the industrial issue. However, before negotiations on this issue are progressed further your urgent advice of your position and the Service-wide attitude to be adopted on this issue would be appreciated.

  In addition your advice as to whether the Board has expressed a view, or intends to express a view on this matter to staff associations would also be appreciated'.

- On 13 June a Departmental representative met again with APSA to discuss the classification of the Regional Hardware Controller position. Essentially no change resulted from the meeting although APSA did indicate support for the position being in the Clerical Assistant structure.

- On 3 July 1984, in a National Consultative meeting with APSA the Department put forward a suggestion that the eyesight test issue be put to an independent committee for resolution.

7.2 In spite of this impressive number of meetings the present position is that APSA imposed a ban on the release of stores to the Redfern regional office on 4 April 1984. This prevented the implementation of the word processing phase of Stratplan and has effectively halted all systems implementation. Their main complaint is the lack of ophthamological or optometric eye testing facilities and the inability of the Department to guarantee the radiation emission levels from terminals.

7.3 The ACOA agree with the need for eyesight and radiation tests and have placed these two items as basic requirements before the system is implemented. In addition the association has demanded that a full staff impact study be carried out for Stratplan.

7.4 In 1968 the Commonwealth Conciliation and Arbitration Commission brought down a judgement in favour of the Federated Clerks Union which was regarded as a benchmark on the respective responsibilities of employers and unions in situations of technological change. The Full Bench judgement commented

> 'Many real human problems may be involved which may not be known to company executives and they, with the best will in the world, may take steps which do not help to solve them. It is our view that employees and their welfare are as important in the planning of a change of the kind we have had to consider as any other aspect of the change and that they, both individually and through their union, should be brought in at the planning stage. When brought into the planning both employees and the union should in their turn attempt to understand the problems which the employer faces and co-operate with him to try to find a reasonable solution ... If in the future, the Commission's attention is drawn to instances in which the future welfare of employees has not in its view been properly dealt with in company planning, the Commission may find it necessary to intervene in the interests of industrial justice.' (1968, 122 CAR 339 at p. 345)

7.5 This judgement is especially pertinent where the Public Service is involved.

7.6 The ACOA presented a submission to the Committee on its dealings with the Department. A copy of this is at Attachment A.

7.7 Mr J Pearce, senior industrial officer, ACOA, represented his organization at a hearing and spoke of the lack of any element of trust in his negotiations with the Department.

He stated that the plan for ADP re-equipment was developed in secrecy in 1981 without the knowledge of the ACOA and without consultation on the issues raised, although this was in breach of an agreement previously made with the Department. He also criticised the manner in which the possible staff savings were interpolated in order to cause a favourable impression in Cabinet when the submission was presented.

7.8 The Department pointed to the considerable eforts it had expended in designing and purchasing ergonomic furniture and equipment and in keeping staff informed of progress once the Cabinet decision had been taken. It also agreed with APSA that keyboard operators should have 10 minute breaks every hour in addition to normal personal hygiene and meal breaks.

Conclusions and Recommendations

7.9 The Committee has concluded that industrial relations between staff and management are difficult due mainly to the inability of the Department to provide health and safety tests to employees regarding eyesight and possible radiation emission problems from screen based equipment. The Department is constrained by the Public Service Board which is responsible for setting standards for staff conditions of service.

7.10 The Committee believes that the issues of industrial relations, particularly in the areas of occupational health, could have been resolved in the planning stage with agreement between the PSB and staff associations. This was made clear by the Director-General in his letter to the Chairman of the PSB on 4 June 1984 when he said:

> 'This Department has two issues relating to occupational health and the introduction of Stratplan which are the subject of dispute with the two relevant staff associations. The first is the question of eyesight testing for VDU operators and the second radiation testing of VDUs.
>
> 'There seems to me to be an element of insanity in an industrial dispute between a Commonwealth department or agency and unions on occupational health issues. Obviously, if there is a genuine health problem, as a responsible employer the Commonwealth should take all necessary corrective action. If there is not a genuine health problem, the taxpayer should not be held to ransom to provide unnecessary and expensive equipment and services which may also serve to create unnecessary anxiety in some staff.

'I fully support your view that these occupational health matters are too important to be negotiated in isolation by individual departments and agencies. It does seem to me to be an issue on which leadership is required from the Board. I believe that all Commonwealth employing agencies and the ACTU should be able to settle on common occupational health standards, based on the best advice available. I would ask that the Board initiate action in this direction.'

7.11 The Committee agrees with the principle expressed by the Director-General of the Department of Social Security that the issues of eyesight testing for visual display unit operators and radiation emission testing of the visual display units themselves, should be resolved through negotiations between the Public Service Board and the staff associations.

7.12 The Committee recommends that:

7. The Public Service Board, acting on behalf of all Government departments and agencies, and in consultation with other appropriate agencies, establish and promulgate common occupational health and safety standards as a matter of urgency.

7.13 The Committee has concluded that the Department of Social Security has taken some steps towards satisfying the demands of the staff associations through the supply of ergonomically designed furniture, the acceptance of regular breaks for keyboard operators and the issue of information sheets for staff on the progress of Stratplan. The Committee believes that within the limits imposed on it the Department has gone as far as possible in catering for staff associations' demands regarding health and safety.

7.14 The Committee notes that the Department did not consult the staff associations at the planning stage of Stratplan. The associations obtained information from a copy of the Strategic Plan that 2,400 or 2,700 staff would be saved by the introduction of Stratplan.

7.15 The Committee recommends that:

8. The staff impact study be completed as soon as possible with special emphasis on expected staff savings and reclassifications. A consultant should be employed to stipulate the guidelines of the study in conjunction with the staff association. The Committee wishes to be informed of the results of this study before Stratplan is implemented in each State;

9. Staff, through their associations or via normal communication channels, be kept informed of delays or alterations to the system. This is particularly important for regional office staff; and

10. Staff associations be asked to participate in the systems implementation and be invited to attend the weekly progress meetings chaired by the National Stratplan Co-ordinator.

CHAPTER 8

RESIGNATION OF A SENIOR OFFICER

8.1 During the strategic planning, tendering and final system and product evaluation, Dr E Prince was in charge of the ADP systems branch. In May 1984 he resigned from the Public Service to take up a position with Computer Power, a company based in Melbourne. He was appointed to head a New York venture for the company.

8.2 Computer Power had been successful in their tenders to the Department of Social Security for a data management package valued at $1.9 million, a text retrieval system worth some $50 000 and to supply on contract from their subsidiary, Computer People, 34 out of a total of 90 contracted programmers. This contract is worth about $1.5 million per year to Computer Power.

8.3 The Acting Director-General informed the Committee of the processes the Department had undertaken to ensure the Commonwealth had not been disadvantaged or that Computer Power had not received an unfair advantage by Dr Prince's action. The Acting Director-General tabled two reports, one by the Chief Internal Auditor and the second, which is copied in Attachment B, by a committee comprising himself, Mr Monaghan of the Public Service Board and Mr Hamilton of the Department of Prime Minister and Cabinet.

8.4 The report by the Chief Internal Auditor, Mr Brian Leonard, went beyond the narrow sphere of responsibility described in the Public Service Board's 'Guidelines on Official Conduct of Commonwealth Public Servants' as it covered past and possible future purchases or agreements that could have been influenced by Dr Prince. Beyond a fairly minor indiscretion in discussing data management packages sold by Computer Power with another organisation the Chief Internal Auditor felt that there was no evidence to suggest that there was any impropriety in the action taken by Dr Prince or Computer Power.

8.5 The key factors in this determination were described as follows:

- There was an independent external consultant who reviewed the tender documents to ensure there was no bias in favour of a particular vendor;
- A senior management team took all decisions relating to the tender;
- The evaluation criteria were met before tenders were received by the Department of Social Security;

- Two external consultants (Coopers & Lybrand and Urwick International) advised the Department of Social Security on all recommendations; and

- An independent assessor (Logica) was appointed by the Department of Administrative Services to monitor and review all decisions.

8.6 The Chief Internal Auditor who was assisted by the Assistant Director-General (Systems Maintenance) who advised on technical matters, concluded his report by stating:

> 'The tender evaluation process contained an exhaustive system of checks and balances, reporting and mechanisms which clearly were introduced to safeguard the Commonwealth's interests in getting the best and most cost effective solution to DSS requirements.
>
> 'With the minor exception of recently providing a referee's comment, I have found no areas in which justifiable allegation of impropriety could be made against Dr Prince'.

Conclusion

8.7 The Committee has concluded that the procedures for ensuring propriety by Commonwealth officers accepting employment in the private sector have followed the established guidelines. However, the Committee may wish to review the guidelines as a separate issue at a later stage.

CHAPTER 9

STRATPLAN OFFSETS

Australian Government Offsets Policy

9.1 Offsets are deemed to be work directed to Australia by an overseas supplier as a result of receiving, or in anticipation of receiving, a major order for equipment or services in which the Australian Government is involved. It is a policy of the Australian Government that offsets work be directed back to Australian industry by an overseas supplier who receives a major Government order. The Australian Offsets Programme seeks to secure workload which will broaden the capabilities of industries which are of defence or technological significance to Australia, and stimulate technological advancement in Australian industries. It aims also to provide new and expanded employment opportunities within Australian industry. All contracts for purchase or lease valued at $1 million or more with a minimum of $0.5 million imported content come within the scope of the offsets policy. Potential overseas tenderers to the Commonwealth are required to agree to place offsets work in Australia for a total of at least 30% of the contract value for offsets purposes. The contract value for offsets purposes is defined as the contract value less the value of Australian local content included in the contract for reasons other than providing approved offsets. Where offsets requirements are exceeded, offset credits may accrue, and these may be used to meet the offsets requirments of any future contract. The Offsets Section of the Department of Defence Support, as the offsets authority, provides general advice to tendering and contracting authorities on the offsets policy. The Offsets Section has a discretionary power in the allocation of offsets credits. It also advises the purchasing authority regarding the acceptability of offset offers and the fulfillment of offset commitments subsequent to a contract being arranged.

Department of Social Security Involvement in Implementation of Offsets Policy

9.2 The Department took an active interest in the possible offsets implications of the Stratplan contract to avoid any situation that might impede implementation of Stratplan. A visit to the United States of America by senior officers of the Departments of Social Security and Administrative Services was arranged in order to determine that major tenderers were aware of Departmental concerns related to the implementation of Stratplan, and were making a commitment to offsets obligations.

9.3 The Companies involved with the Stratplan contracts are Wang, Amdahl, Storage Technology, Computer Power and IBM.

Offsets Commitments

9.4 As noted above, it is the responsibility of the Offsets Section, Department of Defence Support, to monitor Offsets Agreements once Stratplan purchase contracts have been signed. The information below has been provided by the Department of Defence Support.

Wang

9.5 Wang established a factory in Canberra to manufacture colour work stations in April 1984. The Wang factory currently employs 24 staff, and by the end of 1985 should employ about 100 and will result in further employment in sub-contracting companies. About 70% of its current workforce have been recruited from the Canberra area, and Wang anticipate that this trend will continue. The production run is estimated at some 11 000 units over the next 3 years as a minimum. Wang is also committed to maximum local sourcing of components. Wang software development will involve additional employment of 10 high technology software researchers and developers in Canberra. The total value of Wang's offsets commitment is estimated at $11 million over the next three years.

Amdahl

9.6 Amdahl agreed to develop systems software products, including a data-base facility, language compiler, teleprocessing monitor, job accounting and X25 network interface software modules, which are connected with its new operating systems, in association with Computer Sciences of Australia. Total value of this development has been estimated at $3 million. It is expected to employ directly 18 personnel in the first year, and some 38 personnel by the third year, in very high technology software development.

Storage Technology

9.7 Storage Technology has a major commitment to advanced software development in Australia for their new optical disk project. Storage Technology is also committed to setting up a reconditioning and repair plant for computer mainframe peripherals in Australia, as well as to local sourcing of some components for mainframe peripherals. At least 10 people will be employed as a result of these proposals, mainly in high technology software development. The total value of this commitment has been estimated at $3 million over the next 8 years.

Computer Power

9.8 This company has committed itself to establish a software development house in Canberra to work on data management software development and also to act as a sub-contract house for outside orders. The total value of this commitment is set at $280 000.

IBM

9.9 IBM has accumulated substantial offsets credits by announcing that its personal computers and CPUs will be manufactured at its Wangaratta facility and through its continued software development in Australia. IBM propose to use these credits to cover the offsets requirements of Stratplan.

Action Taken to Comply with Offsets Agreement

9.10 On 18 August 1984 the Department of Defence Support advised the Committee that the present position of the offset arrangements was as follows:

- Wang have advised that the following orders have been placed.
  - Circuit Technology of Australia. 1200 Multiwire Boards - $336 445.00.
  - Austral Standard Cables, dual W axial cable, cable assemblies, power cords - $700 000.
  - Columbia Products. Range of ribbons 180 000 units - $540 000.00.
- Wang also advised that:
  - a letter of intent has been signed with Printronics for the supply of circuit boards, value $264 000. Negotiations are continuing with other suppliers.
  - negotiations are continuing with suppliers of power equipment.
- Amdahl has advised that an order has been placed with Computer Sciences of Australia worth $2.7m for the development of systems software. An order has also been placed with systems technology for the porting of selected software modules on the Amdahl 4400 series network concentractors.

- Storage Technology has placed an order with Computer Power for the development of optical disc software. The initial order amounts to $700 000. Negotiations are continuing with the two companies for additional orders. Storage Technology were unsuccessful in finding a supplier of cables. It is understood that the establishment of the offsets workshop is proceeding.

- The Computer Corporation of America wrote and marketed the Model 204 database. The package was sold to the Department of Social Security through Computer Power. A deed of agreement was completed with Computer Corporation of America. A progress report is awaited.

- IBM have used their existing offsets credits to meet their obligation.

Conclusions and Recommendation

9.11 It would appear to the Committee that both Storage Technology and Computer Corporation of America have not at this stage met their offset agreements. The Committee believes that the benefits of the offset program will be less than predicted. The Committee regards compliance with offset arrangements as vital to advance the capability and capacity of Australian industry and will monitor this aspect of the Stratplan project closely.

9.12 The Committee therefore recommends that:

11. All offsets agreements be signed prior to contracts being let.

CHAPTER 10

PROJECT MANAGEMENT

10.1 The Department of Social Security presented a submission to the Committee on Project Management which is reproduced at Attachment D. The Department's project management operation is controlled hierarchically and has relied upon the commitment of its senior officers to understanding the system in detail. A schematic diagram of their reporting lines is at figure 1.

10.2 The ADP Division uses an automated project management system which runs on a Wang minicomputer. It is designed to show each project leader the status of his area of responsibility and also the status of other project teams he may rely on or which may be relying on him. Its advantage is its simplicity of use though, because it omits financial information, it is more a scheduling system than a project management system.

10.3 The Department uses a software package called SMD/70 to help with system design, and later with project management. This is being used by senior users of the system who believe it helps to document requirements, estimate times and act as a communicative mechanism. Samples of the system's output are shown at Attachment G.

10.4 At the time of this report the Department had just commenced using these systems. In the next report of the Committee the Department's experiences with them as management tools will be discussed.

10.5 The Department has kept the Committee informed of progress of the implementation of its equipment and systems by means of the weekly Project Management Report.

Conclusions

10.6 The Committee has concluded that project management is basically sound, principally because of the commitment of senior staff. However, there are delays in implementation caused mainly by the size of the project and difficult industrial relations.

10.7 In spite of the use of almost 100 contract programmers, consultants and highly motivated and qualified staff, the system implementation will be up to 12 months later than predicted and this delay will probably be more pronounced as the implementation proceeds.

STRATPLAN MANAGEMENT ARRANGEMENTS – COMMITTEE/GROUP REPORTING LINES

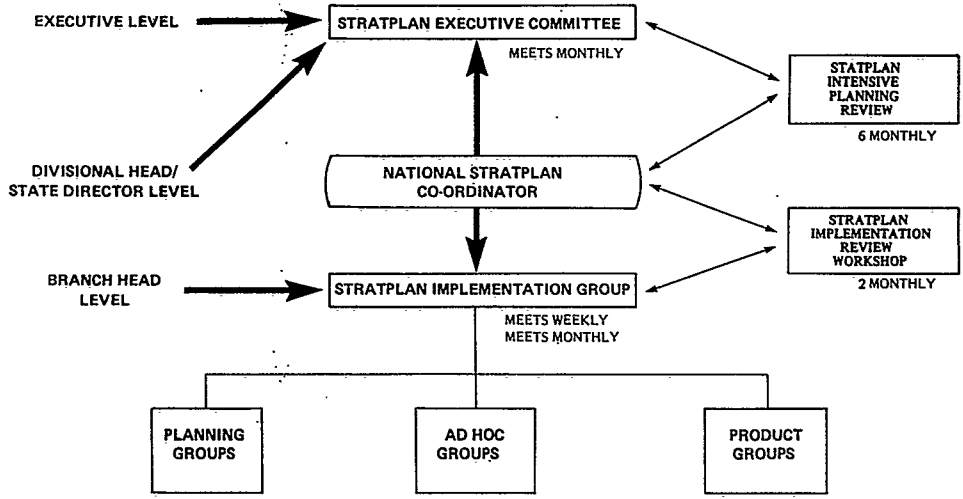

FIGURE 1

10.8 The Department also failed to recognise the staff associations' concerns on health and safety matters and future job prospects of their members.

10.9 Rather than comment in detail at this stage the Committee will monitor the implementation timetable and keep Parliament informed of progress.

CHAPTER 11

FINANCIAL MANAGEMENT

11.1 The Committee received a submission from the Department of Social Security on Financial Management for the project which is reproduced at Attachment C.

11.2 The submission argues that it is essential that the financial management of the total project be vested in the secretariat which services the System Division rather than, by implication, the Finance Branch of the Department.

11.3 The Department was asked to provide a detailed submission to the Committee explaining the differing figures that appeared in various reports regarding the cost of Stratplan. The Committee had noted figures of $143m, $175m, $210m and $234m. The confusion appeared to have arisen when the media continually referred to the '$100m Stratplan system', while Cabinet had agreed to expenditure of $234m over a four year period and an internal memorandum mentioned the cost to be 'expected to amount to $175 m'.

11.4 The Department responded with the following explanations:

- $143 million — Appendix B of the ADP Strategic Plan 1983-84 provides details of the overall expenditure on ADP-related activities. Expenditures against items 1, 3 and 5 are included in the $143 million cost estimate. A dissection of these expenditures between Stratplan and non-Stratplan is at figure 3.

- $175 million — This figure was derived from paragraph 1.63 of the main Report of the Department of Social Security's "Tender Evaluation Report". That paragraph identifies the likely actual cost (10 year net present value at 10% discount) at $174.63 million for Amdahl/Wang with data base system 204.

- $210 million: — This figure represents the estimated expenditures and forward commitments for phasing

the re-equipment, mainframe and user sites, and other ancillary requirements as approved by Cabinet over the years 1982/83 - 1986/87. Prices are as at April 1983 with Computing Equipment being converted to constant prices using a 12% per annum deflater and exchange rate adjustments to end-April 1983.

- $234 million: Following advice from the Department of Finance it was requested that the estimate for Computing Equipment be provided without the inclusion of the 12% per annum deflator. The effect of this change was to increase the item Computing Equipment by approx $24 million giving a revised estimated cost of the 4 year Stratplan proposal of $234 million.

11.5 To add to the uncertainty of the true cost of this project, the Department's ADP Strategic Plan, (see Figure 2, and a further summary of expenditure, Figure 3) refers to figures that are different from those mentioned above.

Rise in Price from the Original Cabinet Decision of December 1981 to the Final Decision in April/May 1983

11.6 The Department acknowledged that the price of Stratplan had increased from the original estimate of $52 million to $119 million and stated that this had been caused by a combination of the rise in exchange rates and the need (because of higher unemployment levels) to purchase 7000 terminals instead of the original estimate of 4000.

Staff Savings

11.7 In the Strategic Plan that was sent to Cabinet in December 1981 there was a clear statement made that 'up to 2700 positions would be released because of Stratplan'. This figure amounted to about 20% of the staff of DSS at that time.

11.8 It is clear to the Committee that this figure was not 'notional'. A statement was made that 'While this figure of staff released is considered to be achievable, some allowance should be made for contingencies. Therefore, a figure of 2400 should be used for planning purposes.'

FIGURE 2

SUMMARY OF EXPENDITURE ON ADP-RELATED RESOURCES

Strategic Plan 1983/84

TABLE B1: OVERALL EXPENDITURE ON ADP-RELATED ACTIVITIES ($'000s)

		BUDGET YEAR							
		1982-83	1983-84	1984-85		1985-86		1986-87	
				a	b	a	b	a	b
1	Hardware	486	30946	43710		28680		9091	
2	Telecommunications Charges	722	1100	3675		4410		4750	
3	Software	206	2882	3280		2346		2764	
4	Maintenance	1399	1929	3959		6759		8116	
5	Environment	1178	5758	7307		4656		1106	
6	Consumables	540	701	721		745		770	
7	Consultants and Contract Services	821	5965	6798		5841		170	
8	Bureaux	3052	2127	833		406		405	
* 9	Manpower	20827	29172	30047		30948		31876	
	TOTAL ITEMS 1-9	29231	80580	100330		84791		59048	

* Includes 85% staff loading

a - expenditure needed to carry on present systems
b - refers to new systems

SUMMARY OF EXPENDITURE ON ADP - RELATED RESOURCES

$m

	1992/93		1993/94		1994/95		1995/96		1996/97		TOTAL	
	1	2	1	2	1	2	1	2	1	2	1	2
Hardware	-	.486	30.699	.257	43.660	.050	28.630	.050	9.041	.050	112. 02	.893
Telecom charges	-	.722	.250	.850	3.055	.820	4.100	.310	4.620	.130	12.025	2.832
Software	-	.208	2.238	.644	2.451	.828	1.595	.761	1.795	.968	8. 07	3.408
Maintenance	-	1.399	.387	1.542	2.933	1.026	6.016	.743	7.842	.474	18.978	5.184
Consumables	-	.540	-	.701	-	.721	-	.745	-	.770	-	3.477
Consultants & Contract Serv.	-	.821	4.895	1.070	5.821	1.177	5.841	-	.170	-	16.527	3.068
Bureaux	-	3.052	.500	1.827	.500	.333	.100	.306	.120	.285	1. 22	5.803
TOTAL	-	7.228	38.969	6.891	58.220	4.756	46.272	2.915	23.388	2.677	168. 84	24.265
Environment (a)	1.178		5.758		7.307		4.656		1.106		20.005	
Manpower (a)	20.827		29.172		30.047		30.948		31.876		142.870	
TOTAL ALL ITEMS	29.231		80.590		100.330		84.781		58.048		353.980	

Column 1 = Stratplan Column 2 = Non-Stratplan

(a) Breakdown of the costs for this item not available

FIGURE 3

11.9 In the Strategic Plan dated 2 February 1983 a figure of 2400 staff savings was again mentioned but in the Strategic Plan of February 1984 there is no figure for staff savings. This was ten months after Cabinet had given its approval to purchase the equipment.

11.10 At the hearing of 23 August 1984 the representative from the Department of Finance stated that his Department would be examining how Stratplan affected staff numbers and as the responsibility for staff ceilings has been transferred from the Public Service Board to the Department of Finance, the Committee will look to the Department of Finance for future advice.

Conclusions and Recommendations

11.12 The Committee has concluded that the project will not realise the monetary savings suggested by the Department of Social Security when the original Strategic Plan was drawn up. Successive Ministers have been given an expectation of staff savings of between 2400 and 2700 as a result of Stratplan. It would now appear that these figures are unrealistic and that the Department has abandoned them.

11.13 Given that staff savings will not occur the Committee believes that the Department did not fully investigate the alternative methods to on-line centralised processing. It is difficult to see how the Department could have expected on-line processing to have such an effect on the size of their staff.

11.14 From the information that has been presented to the Committee, it is apparent that the total project cost is in some doubt and that the financial planning system is incomplete. The financial management of the project will be closely scrutinised by the Committee as part of its role and advice will be sought from the Department of Finance on a regular basis.

11.15 The Committee recommends that:

12. The financial planning system be completed, if necessary with the help of external consultants.

13. The Department review the total project cost, including all attributable staff costs, in conjunction with the Department of Finance. The Committee would expect a submission on this matter as soon as the review has been completed.

11.16 It is apparent to the Committee that the use of staff savings was clearly intended to influence the Government about the cost effectiveness of the project in the early stages of the system development. However at a hearing of the Joint Committee of Public Accounts held in Parliament House on 23 August 1984 the Department's witness stated:

'It is certainly clear that Stratplan and the better systems that come with Stratplan will improve the quality of work done within the Department and improve the quality of service to the client. We do not expect that that is going to result in any staff savings'.

He went on to say that work restructuring could result in staff savings and a staffing impact study was currently underway and that the Department had not forgotten the need for a cost-benefit result.

11.17 During the life of the project the Committee will expect to be convinced that Stratplan is a cost effective system and will report to Parliament accordingly. To this end the Committee recommends that:

14. The Department of Social Security review the cost effectiveness of the project in conjunction with the Department of Finance and advise the Committee accordingly.

15. Following the review the Department of Finance continue to oversee the personnel aspects and the overall costs of the project and report to the Committee on a regular basis;

16. The Australian Audit Office audit the system regularly and be assured that the Department's ADP Internal Audit has obtained the best advice on all matters of data and system security;

17. The Department report progress and problems on a monthly basis to the Committee and the Australian Audit Office. These reports should include discrepancies of time or costs from the planned schedule; and

ATTACHMENTS TO THE REPORT ON STRATPLAN - DEPARTMENT OF SOCIAL SECURITY ADP RE-EQUIPMENT PROGRAM

ATTACHMENT		
A	ACOA Submission	73
B	Clearance Report on Dr Prince	85
C	DSS Submission on Financial Management	89
D	DSS Submission on Project Management	99
E	Submission from Ms Kerry Liddicoat	105
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ACOA SUBMISSION

INDUSTRIAL RELATIONS ASPECTS OF THE STRATPLAN COMPUTER RE-EQUIPMENT BY THE DEPARTMENT OF SOCIAL SECURITY MAY 1984

A. INTRODUCTION

1. The Administrative and Clerical Officers' Association, Australian Government Employment, is an organisation registered under the Conciliation and Arbitration Act representing over 48,000 members employed by the Commonwealth and Northern Territory Public Service Statutory Authorities. The Association is the largest union in the Australian Government Sector and membership of the Association is open to all First, Second and Third division administrative and clerical staff in Departments of State, equivalent officers in many statutory bodies outside the Public Service Act including Telecom, Australia Post and the Health Insurance Commission and Statutory Office holders. Approximately 80% of eligible staff are members of the Association.

2. Amongst ACOA's membership are over 6,000 employees of the Department of Social Security. ACOA's membership in the Department of Social Security includes staff employed at Central Office, State Headquarters and in the Department's Regional Office network in over 180 offices. ACOA members are involved in the full range of Departmental activity including policy formulation, maintenance of welfare system and general administration of the Department.

3. ACOA has demonstrated over a long period a very strong concern about most aspects of the delivery of Social Welfare in Australia. This concern has been particularly shared by our membership in the Department of Social Security who have

demonstrated a strong interest in matters relating to the scope of benefits and level of benefits available to Departmental clients and the quality of service provided by the Department of Social Security to its clients. ACOA is active in the Trade Union movement on these issues and is represented on the Australian Council of Trade Unions Social Welfare Committee. ACOA also has regular contacts with Australian Council of Social Service and other welfare groups at National, State and regional level.

B. BACKGROUND TO STRATPLAN

4. In order to appreciate the industrial relations considerations associated with the introduction of Stratplan, in ACOA's view, it is necessary to briefly examine the background to the development of, and the perceived governmental deliberations in relation to, the Department's computer re-equipment. The first consideration is that during 1981, when the first Strategic Plan was being developed, this was done in secrecy and without any knowledge of ACOA or consultation on the issues raised. This level of secrecy was maintained despite the clear obligations of the Department under the then existing National Consultative Agreement in Attachment (1) of this submission and the Committee's attention is drawn to paragraph (3) of the Agreement.

5. The second consideration relates to the circumstances in which the governmental decision was made to "go ahead" with the implementation of Stratplan. The Cabinet decision was reported in late December, 1981, immediately after the cessation of the staffing dispute in the Department of Social Security. ACOA is aware from the various documentation, including the 1981 Strategic Plan, that the proposal put to the Cabinet indicated that there would be significant long term staff savings following from the implementation of Stratplan (the figure of 2,700 was used) and that the computer equipment would ensure greater reliability of benefits service in the event of industrial disputes. ACOA believes that these arguments would have been fairly compelling to a government which had just endured an

eight week industrial dispute over staffing and during that period had not been able to maintain benefit payments as a result of standing down large numbers of ACOA members. Considering the manner in which the proposal had been presented to the government, and the timing of the proposal, ACOA was naturally very sensitive in relation to Stratplan and this sensitivity was not improved by the veil of secrecy which was again drawn over preparation for the implementation of Stratplan in the first nine months of 1982.

6. This background explains how, in part, a relatively straightforward computer re-equipment, admittedly on a large and sophisticated scale, rapidly became a matter of considerable controversy amongst ACOA members in the Department. In ACOA's view, if the Department had handled the introduction of Stratplan with less secrecy and more honesty, both in its dealings with the government and ACOA, then industrial relations problems could have been identified earlier and action taken to resolve them more quickly.

C. INDUSTRIAL RELATIONS IN THE DEPARTMENT OF SOCIAL SECURITY

7. The Department of Social Security has recently had fairly volatile industrial relations considering it is an overwhelmingly white collar employer. Apart from the major staffing dispute in 1981 there had been earlier staffing disputes involving work bans and strikes in 1977, 1978 and 1980. Since the 1981 staffing dispute there have been disputes in 1982 concerning introduction of casual employment in NSW and a recent dispute in 1984 relating to the redeployment of Asset Test staff from the Department. There are currently work bans in place in NSW and threatened in Victoria and Western Australia on staffing issues in the Department.

8. In these circumstances it might have been expected that the Department should conduct its industrial relations with great care and proficiency. However, in ACOA's view this has not been the case. Some features of the conduct of industrial relations in recent years have included:-

- Lack of continuity of policy of the Department and abrogation of previous agreements reached between the Department and ACOA. The most significant rescission of previously reached agreements was that in 1981 of the National Consultative Agreement which have been part of the basis of settlement of an earlier dispute in 1980. (At subsequent meetings with the Minister for Social Security, Senator Chaney, it was made clear to ACOA that this was a decision of the Department and not the government). Decisions of this nature are regarded as particularly damaging to the conduct of industrial relations since they undermine the prospect of trust which must be an essential part of the relationships between the employer and the union in negotiations.

- Attempts to undermine ACOA by ignoring traditional communication channels and assistance in the formation of unregistered associations. The best example of this conduct has been the assistance given by the Department to the formation of Regional Managers Associations in NSW and Victoria and attempts by the Department to make the Regional Manager the focus for distribution of information and collection of views on a wide number of matters including personnel policies, training policies and classification matters.

- Restriction of ACOA access to departmental premises for meetings while providing access to unregistered organisations such as the Regional Managers' Associations.

- Restricting the flow of information to ACOA and actively disciplining from time to time Regional Managers who have attempted to inform their staff on what was taking place in relation to particular matters e.g. staffing issues etc. In the area of Stratplan most meaningful information which came to ACOA prior to the election of the current government was through documents which had "fallen off the back of a truck".

- Attempts to determine the nature and level of ACOA representation at meetings with Department.

- In extreme cases, in Victoria, victimisation through the promotional process of well known union activists.

9. The Department appears to have understaffed and under resourced its industrial relations section at an operative level. This has prolonged on occasions industrial disputation.

D. NEGOTIATIONS WITH THE DEPARTMENT ON STRATPLAN

10. ACOA commenced negotiations with the Department of Social Security in relation to Stratplan early in 1982. One of the first steps in the process was a meeting held with the then Minister for Social Security, Senator Chaney on 18 March 1982 in Canberra. Significantly at this first meeting the main issues under discussion were assurances sought by ACOA in relation to redundancies, redeployment problems, funding for accommodation, problems in relation to system design and the provision of adequate facilities to ACOA for the purposes of continuing consultation. The latter issue arose out of ACOA's continuing demand that the National Consultative Agreement be reinstated. This demand was finally achieved in January 1984.

11. Negotiations and exchange of information continued with the Department in a fitful way throughout 1982 and early 1983. It was not until the change of government in March 1983 that a regular pattern of consultation was instituted between ACOA and the Department. This pattern generally settled into monthly meetings and between May 1983 and May 1984 there have been nine meetings. A further meeting is scheduled for 27 June 1984 although ACOA's continuing participation in this process is now subject to National Executive consideration. Consultative meetings were disrupted for a period of three months between October and January 1983/4, following ACOA withdrawal from the meetings until adequate facilities were provided. In addition there was a space of three months between the February 1984 and May 1984 meeting although one meeting of National Consultative body was held in April 1984 and Stratplan matters were discussed. In addition ACOA has met with the Minister for Social Security, Senator Grimes on two occasions in 1984 when matters including Stratplan have been discussed.

12. In general since the election of current Labor Government there has been no difficulty in meeting with the Department and obtaining information on developments in respect of Stratplan. However ACOA has continued to experience frustration in negotiations with the Department over their unwillingness or their inability to accept that key industrial relations issues must be resolved prior to the introduction of Stratplan.

13. This process led to the National Executive in December, 1983 adopting a resolution containing basic threshold demands in relation to Stratplan and determining a strategy for pursuit of industrial action if necessary in support of these threshold demands. At the moment ACOA members in NSW have banned the implementation of Stratplan in Regional Offices until the threshold demands are met. At the time of writing this ban does not extend to preparation of the sites for Stratplan or involvement of ACOA staff in training for the implementation of Stratplan. The full text of the National Executive resolution is set out below:

"1. ACOA recognises that the introduction of Stratplan in DSS has the potential to provide the best possible level of service to clients and the community and to enhance the jobs of members.

2. NE believes

   (a) That the current "Stratplan Briefing" sessions do not constitute consultation between the Department and ACOA;

   (b) Introduction of this technology will lead to increased skills and responsibilities and may necessitate a reclassification of jobs;

   (c) Improved access to information will allow for greater decentralisation of functions.

3. NE adopts the following threshold demands:

   (a) That proper consultation be established between the Department and ACOA, and that ACOA and its representatives be provided with adequate resources and facilities by the Department.

   (b) That the Department immediately provide an undertaking in writing that there will be no redundancies.

   (c) That any redeployment of staff will be voluntary and subject to consultation with ACOA.

   (d) That the Department immediately quantify loss of positions resulting from the introduction of Stratplan on a National and State functional basis, and negotiate with ACOA on the means of using these staffing resources to maintain administrative/clerical career structures and provide improved services to clients.

   (e) That ACOA have "negotiation to agreement" rights on changes to work organisation.

   (f) That Stratplan not be used to centralise decision making control within the Department.

   (g) That adequate accommodation standards and arrangements be negotiated and implemented for all DSS offices prior to the introduction of Stratplan. That

procedures also be agreed on the relocation and refurbishment of offices necessary.

(h) That minimum acceptable levels as outlined in the ACOA Screen based Equipment Policy on Health and Safety of members are to be met.

(i) That the Department ensures the protection of privacy of clients at all times.

(j) Questions relating to security and character checks are resolved.

(k) Training procedures and policy including relief for trainees are agreed.

4. Accordingly NE resolves:

(a) That negotiations be continued with the government and Department to achieve these objectives;

(b) That National Bulletin be issued to ACOA members in DSS explaining the background and reasons for NE decision;

(c) ACOA recognises that the achievement of the threshold demands is likely to require National industrial action and campaign support by DSS members well prior to widespread implementation of the system. Sub-branches are requested to consider this aspect and the policy generally prior to the proposed NDC meeting scheduled for February 1984. As an initial measure that ACOA members in Redfern Regional Office be authorised and requested to ban implementation of Stratplan until negotiations have concluded; the February 1984 NDC should recommend to National Executive further National industrial action considered necessary."

14. Since the introduction of the National Executive threshold demands, negotiations have proceeded with the Department on the basis of these demands.

E. CURRENT SITUATION

15. Outlined below in table form is a summary of the current situation in respect of negotiations on the National Executive threshold demands.

Much progress was made in relation to these threshold demands in the period between January and March 1984.

16.	ACOA NATIONAL EXECUTIVE CLAIM	DEPARTMENT/GOVERNMENT RESPONSE
A.	That proper consultation be established between the Department and ACOA and its representatives be provided with adequate facilities by the Department.	On 24 January, the Minister for Social Security reinstated national consultative arrangements. The Department has agreed to provide airfares for members of ACOA working party on Stratplan.
B.	That the Department immediately provide an undertaking in writing that there will be no redundancies.	Undertaking provided by the Minister on 19 January 1984, and reiterated by Department on 15 February 1984.
C.	That any redeployment of staff will be voluntary and subject to consultation with ACOA.	Not agreed.
D.	That the Department immediately quantify loss of positions resulting from the introduction of Stratplan on a National basis	The Department is preparing necessary information. The Department is likely to agree to agree to ACOA participation in the study which is seen as

	and negotiate with ACOA on the means of using these staffing resources to maintain administrative/ clerical career structures and provide improved services to clients.	formulating a model for continuing adjustment. The Minister has agreed to discussions with ACOA on job creation. The Department is awaiting further information from ACOA on the position of site liaison officer.
E.	That ACOA have negotiation to agreement "rights on changes to work organisation".	Undertaking provided (with reservations). On 15 February 1984, the Department acknowledged ACOA's right.
F.	That Stratplan not be used to centralise decision-making within the Department.	Undertaking given on 29 February 1984. Policy to be incorporated in Strategic Plan and promulgated to ADP areas.
G.	That adequate accommodation standards and arrangements be negotiated and implemented for all DSS offices prior to the introduction of Stratplan. That procedures also be agreed on the refurbishment of offices.	Adequate standards have been met in respect of Stratplan. The Department has agreed to ACOA having right of inspection prior to implementation and being provided with site planning details. The ergonomic study issue remains outstanding.
H.	That minimum acceptable levels as outlined in the ACOA Following Screen-based Policy on Health and Safety of members are to be met.	Eye testing is not agreed and remains outstanding. ACOA's provision of advice to the Department the feasibility of "on site" testing is being examined and the Department is expected to provide ACOA with a proposal in the near future.

I.	That the Department ensures the protection of privacy of clients at all times.	Necessary undertaking in terms of policy provided on 15 February 1984.
J.	Questions relating to security and character checks are resolved.	Not agreed, ACOA awaiting Department response.
K.	Training procedures and policy including relief for trainees are agreed.	Relief for training agreed on 29 February 1984. ACOA and the Department also agreed to a joint review of training procedures in late 1984. Problems in relation to the implementation of the agreement appear to have been resolved.

17. From the foregoing table it can be seen that six basis issues remain outstanding in relation to Stratplan. However it can be also seen that four of these issues namely, Radiation Testing in the workplace; Quantification of job loss; Job Creation and Accommodation Standards are under continuing re-assessment by the Department. It is of considerable concern to ACOA that the two fundamental questions of re-deployment policy and eye-sight testing remain outstanding. In a telex to the Department following the last meeting on 22 May 1984, ACOA reiterated that these issues must be resolved for agreement to be reached on the implementation of Stratplan.

In the opinion of ACOA the Parliamentary Accounts Committee can play a role in resolving the industrial relations issue arising out of Stratplan by giving consideration to these issues which are outlined in paragraphs 18 and 19 of this submission.

18. In relation to redeployment of staff arising out of the implementation of Stratplan ACOA has sought that there should be no compulsory transfers. The Department is now totally decentralised and ACOA is particularly concerned that staff may be required to relocate their homes and their families. In this respect it is necessary to note that the impact of Stratplan is likely to be felt most at classification levels of Class 4 or above and at senior Clerical Assistant classification levels. These are senior levels in regional offices and are achieved after considerable time in the Department especially in rural centres. It is relevant that this claim has been agreed by Telecom and Australia Post in similar circumstances in recent years. A second major concern relates to the special circumstances situations which will arise in a fully decentralised Department. These could range from the problems for single parents arranging suitable local child care to problems arising out of ill or incapacitated dependents. ACOA acknowledges that such policy if adopted by the Department might be inconvenience for personnel administration - but this inconvenience is not on the same scale as inconvenience potentially to be experienced by ACOA members.

19. In relation to eye sight testing ACOA has sought that staff should receive a full opthamalogical test every two years. However ACOA has agreed in Telecom to the six tests including the four standard tests now applied in the Australian Public Service plus slit lamp examination of the eye and opthalmological examination of the ocular fundus on a two yearly basis. ACOA will provide to the Committee at the time of submission a detailed costing on this proposal.

DR E.J. PRINCE - ACCEPTANCE OF BUSINESS APPOINTMENT
REPORT OF COMMITTEE OF OFFICIALS, 12 APRIL 1984

Dr Prince, First Assistant Director-General, Systems Division of the Department of Social Security has notified his intention to resign from the Public Service and now seeks official assent to his post-separation employment with Computer Power Australia (CPA), a company which is in a contractual relationship with the Department of Social Security.

2. CPA approached Dr Prince on 26 February 1984 with an offer of appointment as head of the newly created United States subsidiary of CPA which has been established to promote the sale of Australian computer software in America.

3. As the First Assistant Director-General of the Systems Division of the Department Dr Prince is responsible for "STRATPLAN", involving:

- planning and implementation of the re-equipment of national departmental computer systems
- the development and implementation of new on-line systems and ADP procedures for Departmental programs
- development, support and assistance for State Administrations on the Department's national programs;
- provision of high level advice to executive management on ADP systems and techniques.

4. In April 1982 Request for Tender (RFT) was issued for data management software as part of STRATPLAN. Prior to this, Social Security appointed W.D. Scott as consultant to the Department, and the Minister for Administrative Services appointed Logica as Independent Assessor to review each step of the tender process. Two external consultants (Coopers & Lybrand and Urwick International) were appointed to advise the Department of Social Security in relation to the tender evaluation.

5. Having regard to consultant advice (which was not entirely unequivocal) the Department decided to accept Computer Power's Tender for the M204 Data Management System in preference to Cullinet Software's IDMS product. Dr Prince was responsible for the recommendation of acceptance of the Computer Power tender.

6. Dr Prince orally informed Cullinet that it would be given access to information about the evaluation but this has not been done. Subsequently a Freedom of Information (FOI) request was received from Cullinet Software requesting a copy of the evaluation of responses to the data management system tender.

7. The Department's consideration of FOI requirements have led them to refuse access to the documents under sections 36 and 39 of the Act. The Department stated that the public interest

- could be adversely affected by inhibiting future offerings and tenders to the Commonwealth
- has been protected by the appointment of independent technical consultants.

The Department also had regard to section 43 of the Act which exempts business documents, having a commercial value, the disclosure of which would prejudice the future supply of information to the Commonwealth.

8. On being advised of Dr Prince's intention to accept a position with CPA, the Department arranged for a review of all the contracts entered into with Computer Power. The Committee noted that the review which was conducted by the Assistant Director-General of the Internal Audit Branch had revealed several areas meriting close attention:

- The choice of the Computer Power M204 Data Management System in preference to Cullinet's IDMS.
- Factors relating to the decision not to proceed with the previously announced STRATPLAN decision to lease a text retrieval package called STAIRS from IBM Australia Limited and the subsequent decision approved by the STRATPLAN Executive Committee to acquire the product STATUS from CPA.
- Doubts as to the current arrangements in respect of tender selection processes for the engagement of contract programming services. Of 90 contract staff currently employed by the Department 34 people come from the firm Computer Power. Dr Prince has personally approved each selection - but none since 26 February 1984.
- The recommendation of CPA's M204 to outside parties. Because of his position and involvement in the STRATPLAN acquisition process, Dr Prince has from time to time been contacted by interested parties to comment on the qualities of computer products acquired by the Department. In the last 6 months Dr Prince has commented on CPA's M204 data management system to the Queensland State Government Insurance Office, BHP, and more recently to the Victoria State Police. This last comment was given subsequent to his being offered a post with CPA.

9. Given that conflict of interest charges could possibly be levelled against Dr Prince by Cullinet Software once Dr Prince's acceptance of an appointment with Computer Power is announced, the Committee paid particular attention to the following conclusions of the departmental review:

- the tender evaluation process contained an exhaustive system of checks and balances which safeguarded the Commonwealth's interests

- the Independent Assessor (Logica) agreed with the evaluation methodology and with the selection of the Computer Power tender

- no justifiable allegations of impropriety could be made against Dr Prince

- as head of CPA in the United States it seems unlikely that Dr Prince would have direct contact in future dealings with the Commonwealth, at least for the immediate future

- Dr Prince's specialised knowledge of the ADP processing requirements of the Department of Social Security will be of limited advantage to CPA as major acquisitions for STRATPLAN have already been finalised. Therefore it is highly unlikely that Dr Prince's appointment to CPA could be regarded as unfair to competitors.

- as Dr Prince will be based in the United States and will be involved in marketing Australian computer software in the USA it would be unlikely that conflict of interest situations would arise in respect of dealings with the Commonwealth.

10. The Committee was advised that Dr Prince now has no access to any matters concerning Computer Power's contract with the Department and the responsibility for decisions relating to these matters has been transferred to another senior officer.

11. The Committee expressed the view that Dr Prince had shown a lack of discretion in continuing to recommend the data processing equipment to the Victorian Police Force after having been offered a post by the CPA. However, this does not affect the acceptance of his post-separation employment which will be based in the USA.

12. The Committee has received a written undertaking from Dr Prince that, for a period of two years following his resignation, while employed by Computer Power or any other company doing business with the Department of Social Security, he will not engage in any activities of a business nature with the Department.

13. The Committee has also received the written agreement of the Managing Director of Computer Power that Dr Prince will not undertake any direct marketing of CP products or services to the Department or undertake any direct negotiations re existing contracts between CP and the Department for a period of two years from the date of his separation.

14. Dr Prince has acknowledged his formal obligations under section 70(2) of the Crimes Act not to disclose confidential information gained in the course of his official duties.

Recommendation

15. It is recommended that you give assent to Dr Prince to take up his appointment with Computer Power subject to the undertakings set out in paragraphs 12 and 13 above.

J.V. Monaghan
Commissioner
Public Service
Board

J.T. O'Connor
Acting Director-
General,
Department of
Social Security

S.A. Hamilton
First Assistant
Secretary,
Department of the
Prime Minister
and Cabinet

JOINT COMMITTEE ON PUBLIC ACCOUNTS
MONITORING AND REPORTING ON THE IMPLEMENTATION OF STRATPLAN IN THE DEPARTMENT OF SOCIAL SECURITY

THE FINANCIAL CONTROL OF STRATPLAN

1. INTRODUCTION

1.1 STRATPLAN

Stratplan is a major ADP re-equipment programme for the Department of Social Security. It involves installing many thousands of items of computer hardware at over 230 sites throughout the Commonwealth. Over the four years of implementation the total cost of Stratplan is estimated to be about 230 million dollars. Contracts with major suppliers for the provision of hardware and software are valued at about 120 million dollars.

1.2 PROJECT & BUDGETARY CONTROL

As is is the case with any large project of this scope, Stratplan is continually evolving, as, one the one hand, the technical requirements for the implementation of the project clarify, and, on the other, the Department's requirements in order to effectively service its client population change. Stratplan is a dynamic project in a fluid service environment, and, clearly, in an operation of such magnitude and complexity, effective controls are necessary to ensure that implementation proceeds as smoothly and as efficiently as possible in accordance with a pre-determined timetable - the implementation plan - getting the job done on time. The other vital and related consideration is money - the financial management of the project. The Audit Act and the Finance Regulations require strict financial controls on expenditure. In addition, the scale and complexity, and therefore the high cost, of Stratplan gives it a prominent political profile, which means, of course, that a good deal of intense scrutiny comes from sources outside the Department of Social Security, such as the Department of Finance, various Parliamentary committees, and the public in general. This is particularly true in the context of the current Government budgetary situation. The department has taken the necessary steps to ensure responsible, accountable and fully auditable financial management of the Stratplan project.

1.3 THE DEPARTMENT'S RESPONSE: SYSTEMS DIVISION

Very early in the planning stages of Stratplan the department, recognizing the exceptional nature and scale of the re-equipment programme, made certain functional arrangements to ensure the efficient financial administration of the project. The most important of these was the creation of a 'Strategic Planning and Development Group', of divisional status, reponsible for the planning and implementation of Stratplan. This group, along with the old ADP Branch, now comprises Systems Division. Systems Division has five major areas of operation:

(a) planning and general applications, which includes strategic planning, database management and project control;

(b) the provision of technical services, involving installation management, mainframe and regional computer systems;

(c) administration of the National Computer Centre, Deakin;

(d) consideration of income and security applications, and

(e) finally, Systems Division is responsible for the administration of the great majority (78%, see below) of the Stratplan funds.

1.4 FINANCIAL CONTROL: SYSTEMS DIVISION

While the Finance Branch of the Department has statutory control over the expenditure of Stratplan funds, a Section known as the Systems Division Secretariat, reporting directly to the First Assistant Director-General (FADG) of Systems Division, has been given responsibility for the financial management of Stratplan funds administered by Systems Division.

1.5 THE RATIONALE: EFFECTIVE FINANCIAL MANAGEMENT

The significance of this is that it recognizes the fact that effective management, and particularly financial control, is dependent upon information: namely, its integrity, the quality of its presentation, and its efficient transmission. These three issues (and they are explored in more detail below) have been addressed in the following ways: firstly, a functional structure has been developed which facilitates the flow of information quickly and efficiently to the proper managerial level, in this case the FADG. This functional mechanism is governed by clear and concise procedural outlines. Secondly, data-base software packages, both in use and under development, provide an automatic on-line data-processing facility which can sort the information and present it in the most useful and informative format. These measures combine to ensure full accountability and thorough auditability of the financial management of the project.

2. STRATPLAN: THE CABINET DECISIONS

Cabinet approved the implementation of Stratplan on 30 May 1983. This approval involved a total estimated expenditure of 210.66 million dollars, with spending on hardware and software authorized to an estimated 95.3 million dollars, over a four year period. This latter estimate was subsequently amended upwards by 24.2 million dollars by Cabinet on 22 November 1983 to 119.5 million dollars, bringing the total cost to 234.86 million dollars.

3. THE ALLOCATION OF MONIES

The funds noted above are to be given to the Department of Social Security on a yearly basis within the framework of the government budgetary and estimates cycle. Forward obligations were made for the supply of the hardware and software items under Stratplan. Furthermore, all Stratplan items are covered by separate charge codes. The funds are divided into functional appropriations, with Departmental control apportioned into three areas of divisional responsibility. These areas are:

(a) Systems Division: about 183 million dollars, or 78% (for Systems Division responsibilities, see below);

(b) Operations Support Division: responsibility for accommodation, computer-room fitout for mainframe and regional sites, with funds of about 37 million dollars, or 16%; and

(c) Resource Management Division: responsible for ADP training, with 14 million dollars, or 6%.

Finance Branch of the Department of Social Security has overall statutory responsibility for the expenditure of the funds.

4. STRATPLAN PROGRESS MEETINGS

Regular quarterly review meetings are held between the Department of Social Security and the Department of Finance to discuss the progress of the implementation of Stratplan. Secretariat prepares the financial

statements for this meeting in respects of Systems Division's areas of responsibility.

5. SYSTEMS DIVISION: RESPONSIBILITY

Systems Division has the responsibility for the expenditure of Stratplan funds on hardware, software, the hiring of programming consultants, consumables and administrative overheads. Note has already been made of the necessity of efficient information presentation and flow to the executive managerial level if that level is to exercise proper controls. Systems Division has two other areas of responsibility not associated with Stratplan. One is administration of the Assets Test. The other involves purchase of non-Stratplan on-going items, such as technical manuals, contractual maintenance, the lease of computing equipment, etc.

6. THE ROLE OF SECRETARIAT SECTION

Secretariat, a section within Systems Division, is the financial-administrative focus for the Division, and as such is the central clearing house for the accumulation and dissemination of financial and contractual information. It functions as the Divisional administrative centre responsible for the provision of general support for Systems Division and also as the Stratplan contract administration centre. Secretariat consists of the following sub-sections:

(a)Contract Programmers, Systems and Procedures

(b) Finance and Estimates

(c) Contract Administration

Through Secretariat a co-ordinating control is exerted on contract administration, which includes maintenance and programmers, and on the ordering and payments process in relation to these suppliers. All capital equipment is thus purchased through Secretariat, which exercises delegations in respects of Finance Regulations 45.1.g (ii) and 56, which relate to the payment of accounts. Arrangements have been made to enable Secretariat to exercise a delegation with regard to Finance Regulation 52A (placing of orders). Detailed procedures for the various functions of Secretariat have been prepared to ensure that all requests for equipment, support and other services are met as contracted in the most efficient manner.

This centralizing of activity involves Secretariat in two further functions. Firstly, it performs a central

co-ordinating role between Systems Division, Finance Branch and the Department of Finance, with particular regard to the quarterly Stratplan progress meetings. Secondly, Secretariat services the Systems Division Budget Committee.

7. THE SYSTEMS DIVISION BUDGET COMMITTEE

This committee is the prime monitoring mechanism within Systems Division for the control of funds approved under Stratplan. It meets, on average, every month, with meetings being held more frequently (fortnightly) during periods of formal estimating submissions.The Budget Committee, which is chaired by the FADG Systems Division, is comprised of representatives of the various 'Budget Centres'.

8. SYSTEMS DIVISION BUDGET CENTRES

These are the basic cells of accountability for specific areas of expenditure and project control. There are seven budget centres, designated 'A' through 'G':

(A) Installations and Resource Management, responsible for mainframe hardware;

(B) Technical Services Branch, mainly responsible for certain contract personnel;

(C) Secretariat, responsible for consultants, consumables, and administrative overheads;

(D) Planning and General Applications, responsible for database software, strategic planning and applications facilities;

(E) Income Security Applications, responsible for contract personnel involved in the development of software applications applicable to income security;

(F) Regional Systems, responsible for Regional Office/User Installation hardware and software; and

(G) Mainframe Systems, which is responsible for the purchasing, leasing and maintenance of mainframe software.

9. BUDGET CENTRES: FUNCTION

The representatives of these Budget Centres that comprise the Budget Committee are, with one exception

(see below) of the Branch Head (Assistant Director-General) or Section Head (Computer Systems Operator Grade 5 or Clerk Class 11) level. The actual composition is as follows:

FADG (Systems Division)
ADG (Planning & General Applications)
ADG (Income Security Applications)
ADG (Technical Services)
Director (Installations and Resource Management
Director (Regional Systems)
Director (Strategic Planning)
Director (Secretariat)
Assistant-Director (Finance and Estimates Sub-section, Secretariat)

Budget Centres provide technical input into the implementation of the project, and are responsible for ensuring that the implementation plan is adhered to in repect of its designated area of responsibility. Any proposed courses of action based on technical advice from a Budget Centre, will, of course, have certain financial implications. An example might be that an upgrade in processing capacity may be necessary at a mainframe site, requiring the acquisition of an additional CPU. The financial ramifications of this proposal are examined by Secretariat, and, at a subsequent Budget Meeting, this technical advice (the reasons why an additional CPU may be necessary) and the financial implications of this advice are considered, with the FADG making his decision. A further function of the Budget Committee, therefore, involves the rearranging of priorities, and, if necessary, the reallocation of funds between Budget Centres (the total amount of funds remaining, of course, the same). This flexibility is a great advantage. Through the Budget Committee technical input and financial management are reconciled. The committee, within the context of available funds determines spending priorities and also monitors financial commitments and spending levels. This enables the Budget Centres to also indicate new areas of potential expenditure which is used as input to formal estimates reviews to be put to the Department of Finance. The estimated allocations by Budget Centre are determined by the Budget Committee.

10. SECRETARIAT SECTION AND THE BUDGET COMMITTEE

Secretariat monitors the implementation plan by its key dates to produce forecasts of payment dates. Thus Secretariat is able to inform the Budget Committee of any potential changes in allocations. Each site by

contractor has been costed by Secretariat on the basis of estimated equipment numbers per year (data provided by the Budget Centres) using MULTIPLAN software on a Wang Personal Computer. By adding the costs of those sites likely to be installed in a financial year an accurate forecast of expenditure is possible. Each six months prior to formal estimates bids (draft/three-year forward) the Budget Centres responsible for hardware/software implementation are required to check the planned installation schedule for the quantities of items required for each site, sign it as correct, and return this notification to Secretariat for costing. This information is then fed into budgetary forecasting.

11. THE ADVANTAGES

The supreme advantage of this functional system of a number of cells with specific responsibilities reporting to a central committee chaired by the FADG is that it greatly facilitates the flow of information, giving, as it does, the FADG direct access to information from these Budget Centres. The FADG is therefore not as dependent as he would otherwise be on his immediate subordinates for the supply of information - a supply which is not only slow (as it filters up the line), but which also can be distorted or manipulated (either inadvertantly or not) in the process, thus loosening managerial control and making the determination of accountability almost impossible. For the FADG the Budget Committee is a forum where information can be presented, views can be put, and an overall, balanced view obtained. This greatly facilitates effective decision-making and control.

12. SECRETARIAT & THE BUDGET COMMITTEE: EFFECTIVE CONTROL

The relationship between Secretariat and the Budget Committee is of vital significance in the effective monitoring and control of those Stratplan funds administered by Systems Division. The Budget Committee is the means whereby Secretariat can supplement and check its data on expenditure, and, as Secretariat is the central repository for this data, complete auditable records can be more easily maintained. Also, as expenditure levels are monitored, some indication of overall project management can be gained, for example, serious underspending can be a manifestation of slippage in certain project areas. Through the Budget Centres financial control is firmly interrelated with project control.

13. INFORMATION CENTRALIZATION

The centralization of, and therefore greater accessibility to, information, is a significant aid towards greater management control. As well as structural means to accomplish this, the inherent qualities of automated data-processing reinforce this centralizing trend by creating a central data pool accessible to anybody with authorization.

14. AUTOMATIC PROCESSING OF FINANCIAL DATA

The availability of a suitable on-line data-processing system is a vital element in budgetary control and financial management. There are software packages in use and undergoing development within Secretariat specifically for these purposes.

15. ADP SYSTEMS CURRENTLY IN USE

15.1 FINREP

The package currently in use by Secretariat is FINREP, which is a day to day financial monitoring system reporting transactions, viz., payments and commitments. This is the base data of financial management. FINREP has the capacity to monitor these transactions against individual appropriations on a yearly, i.e., current year, basis. FINREP can also accommodate forward obligations, and is used as a supplement to the Department of Finance IMS ledger system, basically because it provides more basic data. BUDREPT, a subset of FINREP, is the budgetary forecasting software. It identifies by Budget Centre allocations of funds for specific purposes and extracts from FINREP any commitments or payments made for that purpose. BUDREPT can produce reports on either a current year or three year forward programme basis, by providing a summary table of all Budget Centres against allocations formally approved by the Department of Finance.

15.2 CONREP

CONREP is a software system used to administer sub-contracting programming and systems design staff. It monitors expenditure on contract staff, and can also reconcile invoices for programming services from the contracting agencies. CONREP is linked to FINREP, with expenditure by each Budget Centre on contract programming services being recorded and monitored

against the allocations for these services. Appropriate management reports can also be produced.

15.3 MULTIPLAN

These mainframe applications are supplemented by the use of MULTIPLAN software on a Wang Personal Computer, which costs each individual site (using equipment numbers) by contractor by financial year. This information is used to cross-reference data obtained from FINREP. Systems development work is on course to place all financial data onto a central financial data-base which will enable considerable further enhancement of computer-based control mechanisms.

16. ADP SYSTEMS UNDER DEVELOPMENT

A software package undergoing development to adapt it to financial management is the Facilities Management Information System (FMIS). It is planned to release FMIS in phases, with phase one involving processing and storage of data related to the planning, ordering, delivery, installation and acceptance of computer equipment. Future stages will involve the production of a data-base storing contractual details associated with the acquisition and maintenance of computing facilities under Stratplan, being able to accurately monitor and record financial costs associated with the implementation of Stratplan. Thus FMIS, it is anticipated, will act as an asset register of the Department's Stratplan assets.

17. ADP AND PROJECT CONTROL

MAPPS ('Management and Project Planning System') is a PERT ('Programme Evaluation Review Technique') project control software system that monitors the planned dates of software and hardware installation against actual performance. It is a time-management system, representing, in a bar-charting format, the achievement (or otherwise) of target installation dates. Therefore MAPPS currently has some indirect input into the financial administration of Stratplan funds. MAPPS is currently under development so that, at some future date, it might be capable of recording resource levels (e.g., money) against time management, and therefore have a direct impact on financial management.

JOINT COMMITTEE OF PUBLIC ACCOUNTS
MONITORING AND REPORTING ON THE IMPLEMENTATION OF STRATPLAN
IN THE DEPARTMENT OF SOCIAL SECURITY

STRATPLAN PROJECT MANAGEMENT

1. APPROACH

1.1 The Department's approach to project management for Stratplan is based on a number of simple principles:

- That effective project management requires a coordinative management structure to be put in place, cutting across, where necessary, traditional lines of organisational authority;
- that the planning and management of a technically complex project requires regular, self-critical review;
- that in a project which faces inherent contingencies only flexibility in planning will allow us to reorganise areas of exposure to risk. Recognition is itself the key step in minimizing these risks; and
- that current project management techniques and tools should be used and adapted, if necessary, for our purposes.

1.2 These points are elaborated in the following pages.

2. MANAGEMENT STRUCTURE

2.1 A carefully designed management structure has been put in place in the Department to manage the development and implementation of Stratplan. This structure reflects the priority and importance of the project, an orientation towards the final 'user products' that comprise Stratplan and our keenness to ensure that no critical aspect of the project is overlooked.

2.2 The management committee with overall responsibility for Stratplan is the Stratplan Executive Committee (SEC). SEC decides on all policy matters relating to Stratplan and oversights all development and implementation work. All major issues affecting the project are decided by SEC, although, in general it responds to recommendations put to it by other groups whose roles are explained below. SEC comprises -

- a Deputy Director-General (Chair)
- National Manager (Field Operations)

- FADG Systems
- FADG (Resource Management)
- FADG (Operations Support)
- FADG (Subsidies)
- Director, NSW
- Director, Queensland
- National Stratplan Co-ordinator.

(State Directors are members for the time that their States are implementing Stratplan).

SEC meets once a month, and these meetings usually each occupy most of a working day.

2.3 The Deputy Director-General who chairs SEC is the senior officer with direct responsibility for Stratplan and is regarded as the overall project director for the Department. Working directly to him is the National Stratplan Co-ordinator, whose full-time task is to direct the implementation of Stratplan within the policy guidelines set by SEC. His role is central within the Stratplan project management structure. The National Stratplan Co-ordinator co-ordinates functional areas which have specific responsibility for undertaking the diverse tasks comprising Stratplan work, and attempts to bring to light and resolve deficiencies and problems. Each month, the National Stratplan Co-ordinator submits a comprehensive report to SEC on all aspects of the project.

2.4 Under the National Stratplan Co-ordinator are project management staff, special projects staff including 'product' managers, and Stratplan Co-ordinators for each State and Central Office. This organisation cuts across the traditional lines of authority. The National Stratplan Co-ordinator's authority extends into all Divisions of the Department, even though they all have normal line management structure.

2.5 The reason for this approach is that we recognise both the importance of hierarchical co-ordination where there is high interdependence among a large number of specialised activities, and that in the case of Stratplan such inter-dependencies are pronounced. Therefore co-ordination by lateral negotiation in addition to vertical communication must be facilitated.

2.6 The National Stratplan Co-ordinator chairs a group known as the Stratplan Implementation Group (SIG). This group, which meets weekly, reviews progress against the planning networks, identifies problems, decides on means of addressing these problems and, if necessary makes recommendations to SEC. Reference to SEC would be necessary, for example, if a need appeared to have arisen for changes in priorities or target dates.

2.7 SIG comprises, principally, Branch heads from Systems and other Divisions with direct Stratplan functional responsibilities, product managers and major vendor project managers.

2.8 Once a month (one week prior to SEC's meeting), SIG holds an extended meeting to provide an opportunity for -

- detailed reports on progress from all functional areas;
- clarification of interdependencies between work units;
- interchange of information between all areas represented;
- commissioning of papers on agreed matters;
- views to be expressed on topics on which papers have been distributed;
- points to be raised calling for executive decision (ie by SEC);
- reports to be tabled which will be incorporated into the National Stratplan Co-ordinator's monthly report to SEC.

2.9 The usefulness of the regular meetings of SIG can be judged not only in the overt output but also

(i) in their providing a regular and predictable reporting mechanism, for which managers of functional areas must account to their peers for the performance of their own responsibilities, and

(ii) in its cultivation of a positive, problem-solving attitude in the organisation. The formal structure is currently supported, we believe, by extensive goodwill and co-operative attitudes among key personnel.

2.10 The need for a 'product' orientation in the organisation of Stratplan management is reflected in the existence of Product Groups. There is a Product Group for each of the four principal products that will be provided as working tools to Departmental staff in the first phase of Stratplan implementation. These groups comprise user representatives, and representatives of functional areas involved in the development of the product. They are modelled on arrangements used by the Department over several years relating to the introduction of major policy or operational changes.

2.11 Product Groups are responsible for -

- ensuring that the specifications for the products are complete and appropriate to meet the needs of the users;
- ensuring that agreement is reached between all parties involved in the development of the products;
- maintaining the necessary co-ordination and liaison between all parties during the development process, and
- conducting the necessary testing of the products to ensure that they meet the specifications.

Each Product Group is headed by a Product Manager who reports to SIG and the National Stratplan Co-ordinator.

2.12. A number of Planning Groups have also been established which undertake a forward-looking role and study the impact various Departmental initiatives external to Stratplan may have on its implementation. Their purview extends well beyond the first phase of Stratplan. The Planning Groups report to SIG.

2.13 The National Stratplan Co-ordinator is supported by a Central Office Stratplan Co-ordinator and State Stratplan Co-ordinators. The former's tasks are to:

- coordinate Stratplan implementation in Central Office;
- act as a secretariat for all State Straplan co-ordinators, and
- act as a secretariat for SIG.

State Stratplan Co-ordinators

- co-ordinate the introduction of Stratplan within their State, and
- represent State views on National Stratplan matters.

Each State has set up its own project structure, the most advanced being that in New South Wales, which is the first State to receive Stratplan products.

3. PLANNING PROCESS AND TOOLS

3.1 The Department recognises that a complex and lengthy project like Stratplan faces several major sources of contingency:

- the possibility of major policy and legislative changes;
- changes in Departmental staff;
- the supply of products and services by other organisations (including vendors and other departments); and
- technological development.

The need, therefore, for a flexible approach to planning and implementing Stratplan has been met formally by holding Intensive Planning Seminars and Implementation Review Workshops.

3.2 Intensive Planning Seminars are held to review overall management of the Stratplan project. Two have been held so far. The first, held in August 1983, largely devised the present management arrangements and set the direction that the project has taken since then. The recommendations of the second, held in April-May 1984 have yet to be considered by SEC. These seminars have been conducted by an international consultant specialising in leading planning sessions for large organisations.

3.3 The seminars have been attended by a broad range of Departmental officers together with representatives of major vendors. At the first seminar four distinct phases were identified in the implementation of Stratplan. The first of these, known as 'Mission 1' involves the delivery of four products to users in the offices of the Department in New South Wales. These are:

- On Line Enquiry
- On Line Manuals
- Data Entry, and
- Word Processing.

3.4 After the first seminar, plans for the development and delivery of these four products were developed into detailed PERT/CPM networks of activities and milestones. This was done using the project management software package, MAPPS, which is operated on a Wang minicomputer at the Department.

3.5 Between the two Intensive Planning Seminars, a number of workshops have been held at roughly two-monthly intervals. These workshops have allowed regular

self-critical review of implementation to take place. Focussing at a 'tactical' rather than the 'strategic' level of review which is the purpose of the Planning Seminars, the workshops have facilitated problem-identification and the formulation of approaches to their resolution.

3.6 The Department has introduced and is using a comprehensive systems development methodology, a proprietary package known as 'SDM 70". This is being used by the product groups. It is now starting to be used by areas outside the Systems Division.

3.7 As mentioned above, the principal project networking and reporting software package being used is MAPPS. MAPPS is used for maintaining control over product development and work in the various functional areas. Plans have been formulated as precedence networks of defined activities of estimated durations. These are updated weekly, reporting

- work done
- revised durations, if any, and
- revised estimated completion dates.

Selected MAPPS reports are produced and circulated weekly and form principal agenda papers for SIG meetings.

3.8 From time to time additional activities are identified as needing to be included in MAPPS plans or changes in precedence relationships are identified. These are quickly incorporated in the planning networks and updated reports produced.

3.9 Copies of outputs from the MAPPS system are attached for perusal. No attempt is made here to elaborate on these outputs. It is felt that this is best done orally when questions on particular aspects can be raised.

ATTACHMENT E

SUBMISSION BY MS KERRY LIDDICOAT TO COMMITTEE DURING A HEARING ON HEALTH AND SAFETY ASPECTS OF THE STRATPLAN PROJECT

THE HEALTH IMPLICATIONS OF SCREEN BASED EQUIPMENT FOR WOMEN WORKERS

Presented by: Kerry Liddicoat
Senior Occupational Therapist
Mental Health Branch
Capital Territory Health Commission

Section 44
Women Studies
54th ANZAAS Conference

17th May 1984

The Health Implications of Screen-based Equipment for Women Workers

Eight months ago I was given the task to research and prepare a paper outlining the "Health Implications of Screen-based equipment for Women Workers."

I now wish to change that topic to the "ill health implications."

I have used as a theme for this paper a quote from Joel Makower's book "Office Hazards". "We are just beginning to pay the piper for the technological orgy of the past quarter century."

A staggering increase in physical and psychological morbidity in the clerical workplace runs parallel to increased use of new technology.

The occupational group most alarming management by their high casualty rate is the specialist clerical worker designated data processor or word processor. This group is overwhelmingly women. Compared with professional persons regularly using screen based equipment the differences in perceived stress and reported general health problems are significant - (Michael J. Smith et al 1981).

The information outlining "Healthier Workplace profiles" has largely been disregarded. Management has pursued ultra specialization. The clerical VDU operation has become a process worker.

The research of Michael J. Smith and others (NIOSH 1981) looked at the Health Complaints and Job Stress of Video Display Unit Operators. The major finding of the investigation was, and I quote "working with VDU's is associated with high levels of job stress and certain types of health complaints."

Clerical VDU operators showed much higher levels of visual, musculo skeletal and emotional ill health symptons, as well as higher job stress levels than did control subjects and professional operator/users."

Research supports the opinion that Health problems are not only due to the viewing and keying but to the whole VDU work system. The cynical view-points of some union workers and health professionals is that the operator is the "organic peripheral" to sophisticated information technology. The equipment, the job design, has as its greatest priority efficient production.

The job stressors identified as adversely affecting these workers are:

(1) work overload
(2) machine pacing
(3) lack of control over job situation
(4) deadline pressure

The disorders causing greatest concern are repetition strain injuries or occupational overuse injuries.

These injuries are defined as "musculotendinous" injuries of the upper limbs, shoulder girdle and neck caused by overload of particular muscle groups from repeated use, or by the maintenance of constrained postures which result in pain, fatigue and a decline in work performance (Brown et al Med J. Aust 1984)

Some of the common names associated with these injuries are, Tenosynovitis, Epicondylitis, Carpel tunnel syndrome, and Bursitis.

Statistics to support the morbidity rate for women workers in this area are difficult to find. The workers compensation Statistics for each state are collated by different criteria. These figures indicate only the women who have successfully negotiated the obstacle course through to compensation.

The ACT workers compensation office does not keep statistics by disease or injury. Figures on repetition injuries for all government departments were requested by a question in Federal Parliament in 1983. These figures represented an Australia wide casualty rate. In NSW in the year 1981/82 in the category synovitis, bursitis and tenosynovitis 295 clerical and professional new compensation caes were reported. 273 were women.

In the ACT the Repetition Injury Support Group has 254 medically diagnosed members. 250 are women. Of this group 90% have come from government employment.

The real incidence is not known. Poor procedures for reporting injury, uncertain future prospects and the devastating experiences of colleagues already injured leaves women relunctant to take action. Many of them decide to stay and live in a half world of medication and pain. This last choice is made in fear and reflects the feelings of powerlessness in this group of women workers.

We do have a substantial base of anecdotal information. This has been gathered by Union officials, Occupational Health and Safety workers, Support groups for sufferers and now management.

My experience with this group of workers in the ACT, I believe is reflected in the other states and territory.

To stem the tide management services in the clerical workplace are seeking the answer.

Some of the avenues explored are the provision of

1. ergonomically sound furniture; and
2. lectures on Occupational Health by safety officers, Health Professionals, and union representatives.

Many employers are establishing guidelines for reporting and managing injuries. Finance has been allocated for the provision of specialist consultation in the form of physiotherapists trained in ergonomics to advise on furniture and exercise.

These remedies merely bandaid a gaping wound. Work overload, intensified by non-replacement of workers either injured or on leave persists throughout the clerical workplace. For the user, the introduction to VDU's and streamlined key boards, the temptation to forsake all other forms of communication ie. the handwritten memo, has been too great. One employer estimated a 500% increase in registry work with the coming of VDU's.

Repetition injuries are a very obvious and increasing group of injuries in the clerical workplace for women. They are compounded by the stress of the work environment. Occupational stress including machine pacing, lack of input to decision making and work overload is also producing a range of diseases thought to be the province of the high powered executives such as coronary heart disease and gastric disorders. (Haynes and Feinlab 1980)

The health complaints having a significant effect on clerical VDU operators were reported by Michael J. Smith and others (NIOSH 1981). The most frequently reported were:

skin rashes
irritability
fatigue
burning eyes
irritated eyes
eye strain
back pain
painful or stiff arms, necks, shoulders, and legs
hand cramps
stomach pain

A comparison betwen stress in offices and in factories is appropriate. An emerging white collar assembly line is producing many of the adverse health effects seen in "blue collar workers." For the "80's" office workers physical factors; noise; lighting; VDU's and the system; sexual harrassment; boring work; machine paced tasks; lack of career prospects; combine to produce a Dickensian environment for the female clerical specialist.

Ergonomists, hygienists, health professionals and even movie makers have criticised the process line, ultraspecialisation approach to work design. In 1936 Charlie Chaplin portrayed the appaling physical and mental consequences of machine pacing for factory workers.

Healthy workplace profiles have been offered which combine hygiene as well as motivating factors (Herzbeg)

1. Control - workplace
   workload
2. Participation in decision making
3. Support in cohesive work groups
   approachable supervisors
4. Multi skilled position - variety - job rotation
5. Personal Development

The Public Service Board responded with a junior working party. Its findings were released in April 1983. They were general and strongly criticised by several clerical unions. One positive result has been a Public service enquiry into keyboard organisation within government employment. In the meantime individual departments and now the private sector, flail about in an attempt to maintain work levels. Employers are now reporting difficulty in recruitment of clerical keyboard workers.

Studies have shown that specialisation does not increase productivity, why then does management persist with current clerical work design? As part of training assertiveness skills should be mandatory to assist these workers to demand reasonable working conditions, and rates of pay.

The proposed introduction of Occupational Health and Safety Procedures to all workplaces is to be applauded. But in the meantime who will take responsibility and initiative to allay the fears of those workers already in a career as a clerical VDU specialist.

Action must be taken also to assist those acutely afflicted by Occupational ill health.

1. Dignified and sympathetic medical consultation and treatment.
2. Redeployment to meaningful work.
3. Ongoing support from the workplace.
4. Compensation without psychological battering.

And for the permanently disabled a rehabilitation scheme providing:

1. Assistance with daily living tasks (Emergency Housekeeping).
2. Retraining if desired.
3. Adequate financial compensation for the injuries.

In conclusion there are only ill health implications for women workers using screen based equipment while management persists with current work design, worker classification and the rapid irresponsible introduction of information technology. I restate my theme "We are just beginning to pay the piper for the technological orgy of the past quarter century."

Bibliography

An Investigation of Health Complaints and Job Stress in Video Display Operations.

Michael J. Smith, and others. National Institute for Occupational Safety and Health Cincinnati USA

Occupational Repetition Injuries
Guidelines for Diagnosis and Management

Christopher Brown, Bernard Nolan, Donald Faithfull
Medical Journal of Aust. March 1984

Living at Work

F. Emery and Chris Phillips
1973 Study for the Minister for Labour and Immigration

Forum: Womens Occupational Health: Medical, Social and Legal Implications

Occupational Health Hazards of Women: An Overview

Jeanne M. Stillman. Preventive Medicine 7, 1978.

Handling Stress: Current NIOSH Research

Occupational Health and Safety November/December 1983.

Office Hazards. How Your Job Can Make You Sick

Joel Makower - Tilden Press, Washington DC

Womens Occupational Health and the Women's Health Movement

Nami Tatt. Preventive Medicine 7, 1978.

Keyboard Operating Posture and Symptons in Operating

J. Duncan and D. Ferguson. Ergonomics 1974. Vol 17.

Keyboard Design through Physiological Strain Measurements

Zipp, Haider, Halpern and Rohment.
Applied Ergonomics 1983, 14.

Occupational Mental Health. A Neglected Service.

W. Mickleburgh and A. Lee.

1980/81 Workers Compensation Report NSW

1981/2 Workers Compensation Report NSW

LIST OF WITNESSES AND DATES OF PUBLIC HEARINGS

DATE	WITNESS(ES)
26 March 1984	Department of Social Security - Mr J A Battanta, Acting Deputy Director-General - Mr R C Poole, National Stratplan Coordinator - Mr R C Paterson, Director, Strategic Planning - Mr D M Rowlands, Acting Director, Project Management
3 May 1984	In-Camera Hearing
10 May 1984	Department of Social Security - Mr J A Battanta - Mr R C Poole - Mr D M Rowlands - Mr J S Williams, Director, Systems Division Secretariat - Mr R A Hodgson, Assistant Director-General
31 May 1984	Dr W M Burch Ms K E Liddicoat, Occupational Therapist Administrative and Clerical Officers Association - Mr J H Pearce, Senior Industrial Officer - Mr P F Good, Industrial Officer Department of Social Security - Mr R A Hodgson - Mr C R Heaney, Director, Personnel Practices
28 June 1984	Inspection of National Computing Centre, Deakin, ACT
23 August 1984	In-Camera Hearing

Department of Social Security
Canberra,Australia

NETWORK @@OLE3P3 ON VOL200

VERSION : Ver 3.22 1215

LAST UPDATE : 09/25/1984

THURSDAY SEPTEMBER 27, 1984 9:37 AM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

DAILY BAR CHART

STRATPLAN
ONLINE ENQUIRY VERSION 3 PEN & O/P
REPORT SERIES 2300

USER CTN PAGE 1

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 08/20/1984

CREATED ON : 08/21/1984

PROJECT DURATION= 114

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: EARLY START, ACTIVITY NUMBER

RANGE : 29 TO 114.9

	17 SEP 84 0029	24 SEP 84 0036	01 OCT 84 0043	08 OCT 84 0050	15 OCT 84 0057	22 OCT 84 0064	29 OCT 84 0071	05 NOV 84 0078	12 NOV 84 0085	19 NOV 84 0092	26 NOV 84 0099	03 DEC 84 0108
NO. ACTIVITY DESCRIPTION												
6010 DEFINE ONLINE DB ENVIRONMENT	PPPPP	PP*										
9010 INTEGR.TESTING WITH UPDATE (PAYMENTS)	PPPPP	PP*										
14010 DEFINE UPDATE ENVIRONMENT	PPPPP	PP*										
10030 SYSTEM TEST UPDATE (PAYMENTS)	PPPPP	PP*										
13030 INTEGR'N TESTING UPDATE (REMAINDER)	PPPPP	PP*										
5020 OLE STRESS TESTING	PPPPP	PP*										
12030 SYSTEM TEST WITH UPDATE (REMAINDER)	PPPPP	PP*										
16300 PREPARE INSTALLATION NOTIFICATION	PPPPP	PP***	*									
16400 PREPARE MAINTENANCE PLAN	PPPPP	PP***	***									
	:	:	:	:	:	:	:	:	:	:	:	:
7010 DEFINE REF. DATA UPDATE PROCEDURES	PPPP	PP*										
3030 LOAD REHEARSAL	P	PP*										
11030 REHEARSE UPDATE		**	****	*****	***							
16100 COMPUTOR OPERATIONS TRAINING		**	****	*****	***							
16200 C & D TRAINING		**	****	*****	***							
199999 IMPLEMENT FIRST 6 OFFICES						**	*****	*****	*****	**		
20000 POST IMPLEMENTATION REVIEW										***	*****	*****	*****

KEY	
SYMBOL	INDICATES
*	CRITICAL ACT.
+	NON-CRITICAL ACT.
=	FREE FLOAT
-	TOTAL FLOAT
C	COMPLETED ACT.
P	ACT. IN PROGRESS
#	ACT. OUT OF SEQ.

Department of Social Security
Canberra,Australia

METWORK @@OLE3P3 ON VOL200

VERSION : Ver 3.22 1215

LAST UPDATE : 09/25/1984

THURSDAY SEPTEMBER 27, 1984 9:37 AM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY
** TIME ANALYSIS **

STRATPLAN
ONLINE ENQUIRY VERSION 3 PEN & O/P
REPORT SERIES 2500

USER CTW PAGE 1

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 08/20/1984

CREATED ON : 08/21/1984

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: ACTIVITY NUMBER

CURRENT COMPLETION DATE : 12/11/1984

ACT. NO.	ACTIVITY DESCRIPTION	ACT. CODE	L.R.E. DUR.	EARLY START	EARLY FINISH	LATE START	LATE FINISH	FLOAT FF	FLOAT TF	INDICATOR * IF CRIT.
	'A' = ACTUAL DATE '2' = USE AS ACTUAL DATE '3' = NOT EARLIER THAN '4' = NOT LATER THAN									
3030	LOAD REHEARSAL		3.0	21SEP84 A 33.0	26SEP84 38.9	21SEP84 A 33.0	26SEP84 38.9	0.0	0.0	***
5020	OLE STRESS TESTING		22.0	28AUG84 A 9.0	26SEP84 38.9	28AUG84 A 9.0	26SEP84 38.9	0.0	0.0	***
6010	DEFINE ONLINE DB ENVIRONMENT		23.0	21AUG84 A 2.0	26SEP84 38.9	21AUG84 A 2.0	26SEP84 38.9	0.0	0.0	***
7010	DEFINE REF. DATA UPDATE PROCEDURES		7.0	18SEP84 A 30.0	26SEP84 38.9	18SEP84 A 30.0	26SEP84 38.9	0.0	0.0	***
9010	INEGR.TESTING WITH UPDATE (PAYMENTS)		26.0	21AUG84 A 2.0	26SEP84 38.9	21AUG84 A 2.0	26SEP84 38.9	0.0	0.0	***
10030	SYSTEM TEST UPDATE (PAYMENTS)		23.0	27AUG84 A 8.0	26SEP84 38.9	27AUG84 A 8.0	26SEP84 38.9	0.0	0.0	***
11030	REHEARSE UPDATE		14.0	27SEP84 39.0	17OCT84 59.9	27SEP84 39.0	17OCT84 59.9	0.0	0.0	***
12030	SYSTEM TEST WITH UPDATE (REMAINDER)		17.0	04SEP84 A 16.0	26SEP84 38.9	04SEP84 A 16.0	26SEP84 38.9	0.0	0.0	***
13030	INTEGR'N TESTING UPDATE (REMAINDER)		23.0	27AUG84 A 8.0	26SEP84 38.9	27AUG84 A 8.0	26SEP84 38.9	0.0	0.0	***
14010	DEFINE UPDATE ENVIRONMENT		23.0	21AUG84 A 2.0	26SEP84 38.9	21AUG84 A 2.0	26SEP84 38.9	0.0	0.0	***
16100	COMPUTOR OPERATIONS TRAINING		14.0	27SEP84 39.0	17OCT84 59.9	27SEP84 39.0	17OCT84 59.9	0.0	0.0	***
16200	C & D TRAINING		14.0	27SEP84 39.0	17OCT84 59.9	27SEP84 39.0	17OCT84 59.9	0.0	0.0	***
16300	PREPARE INSTALLATION NOTIFICATION		11.0	17SEP84 A 29.0	02OCT84 44.9	17SEP84 A 29.0	02OCT84 44.9	0.0	0.0	***

Department of Social Security
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NETWORK @@OLE3P3 ON VOL200

VERSION : Ver 3.22 1215

LAST UPDATE : 09/25/1984

THURSDAY SEPTEMBER 27, 1984 9:37 AM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

** TIME ANALYSIS **

STRATPLAN
ONLINE ENQUIRY VERSION 3 PEM & O/P

USER CTW PAGE 2

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 08/20/1984

CREATED ON : 08/21/1984

ACT. NO.	ACTIVITY DESCRIPTION	ACT. CODE	L.R.E. DUR.	EARLY START	EARLY FINISH	LATE START	LATE FINISH	FLOAT FF	FLOAT TF	INDICATOR * IF CRIT.
	'A' = ACTUAL DATE '2' = USE AS ACTUAL DATE '3' = NOT EARLIER THAN '4' = NOT LATER THAN									
16400	PREPARE MAINTENANCE PLAN		13.0	17SEP84 A 29.0	04OCT84 46.9	17SEP84 A 29.0	04OCT84 46.9	0.0	0.0	***
20000	POST IMPLEMENTATION REVIEW		20.0	14NOV84 87.0	11DEC84 114.9	14NOV84 87.0	11DEC84 114.9	0.0	0.0	***
199999	IMPLEMENT FIRST 6 OFFICES		19.0	18OCT84 60.0	13NOV84 86.9	18OCT84 60.0	13NOV84 86.9	0.0	0.0	***

Department of Social Security
Canberra,Australia

NETWORK @@DEMN1 ON VOL200

VERSION : VS-20005 08-0823

LAST UPDATE : 25/09/1984

WEDNESDAY SEPTEMBER 26, 1984 3:17 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

DAILY BAR CHART

STRATPLAN
MISSION1-DATA ENTRY
REPORT SERIES 2300

USER CTW PAGE 1

? MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 03/01/1984

CREATED ON : 04/01/1984

PROJECT DURATION= 329

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: EARLY START, ACTIVITY NUMBER

RANGE : 259 TO 329.9

	17 SEP 84 0259	24 SEP 84 0266	01 OCT 84 0273	08 OCT 84 0280	15 OCT 84 0287	22 OCT 84 0294	29 OCT 84 0301	05 NOV 84 0308	12 NOV 84 0315	19 NOV 84 0322	26 NOV 84 0329	03 DEC 84 0336
NO. ACTIVITY DESCRIPTION												
8500 DEV PROCEDURES & ESTAB MAINTENANCE	PPPPP	PP***	****	*****	*****	*****	*					
9210 PROGRAM & SYSTEMS TEST ENHANCEMENTS		PP***	****	*****								
8400 MONITOR DEV OF DOWNLINE LOADING		***	****	*****	*****	***						
9220 INTEGRATION TEST ENHANCEMENTS					*****	*****	*****	*****				
9300 POST IMPLEMENTATION REVIEW								+++++	+++++			
9230 INSTALL ENHANCEMENTS									*****	*****		
9240 NEW RELEASE OF SOFTWARE IN PRODUCTN											*	

SYMBOL	KEY INDICATES
*	CRITICAL ACT.
+	NON-CRITICAL ACT.
=	FREE FLOAT
-	TOTAL FLOAT
C	COMPLETED ACT.
P	ACT. IN PROGRESS
#	ACT. OUT OF SEQ.

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NETWORK @@DEMN1 ON VOL200

VERSION : VS-20005 08-0823

LAST UPDATE : 25/09/1984

WEDNESDAY SEPTEMBER 26, 1984 3:17 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

** TIME ANALYSIS **

STRATPLAN
MISSION1-DATA ENTRY
REPORT SERIES 2500

USER CTW PAGE 1
P MANAGMNT
STATUS : PROCESSED
PROJ. STARTS : 03/01/1984
CREATED ON : 04/01/1984

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: ACTIVITY NUMBER

CURRENT COMPLETION DATE : 26/11/1984

ACT. NO.	ACTIVITY DESCRIPTION	ACT. CODE	L.R.E. DUR.	EARLY START	EARLY FINISH	LATE START	LATE FINISH	FLOAT FF	FLOAT TF	INDICATOR * IF CRIT.
	'1' = ACTUAL DATE '2' = USE AS ACTUAL DATE			'3' = NOT EARLIER THAN		'4' = NOT LATER THAN				
8400	MONITOR DEV OF DOWNLINE LOADING		20.0	26SEP84 268.0	24OCT84 296.9	26SEP84 268.0	24OCT84 296.9	0.0	0.0	***
8500	DEV PROCEDURES & ESTAB MAINTENANCE		25.0	19JUN84 A 169.0	29OCT84 301.9	19JUN84 A 169.0	29OCT84 301.9	0.0	0.0	***
9210	PROGRAM & SYSTEMS TEST ENHANCEMENTS		14.0	24SEP84 A 266.0	12OCT84 284.9	24SEP84 A 266.0	12OCT84 284.9	0.0	0.0	***
9220	INTEGRATION TEST ENHANCEMENTS		20.0	15OCT84 287.0	09NOV84 312.9	15OCT84 287.0	09NOV84 312.9	0.0	0.0	***
9230	INSTALL ENHANCEMENTS		10.0	12NOV84 315.0	23NOV84 326.9	12NOV84 315.0	23NOV84 326.9	0.0	0.0	***
9240	NEW RELEASE OF SOFTWARE IN PRODUCTN		1.0	26NOV84 329.0	26NOV84 329.9	26NOV84 329.0	26NOV84 329.9	0.0	0.0	***
9300	POST IMPLEMENTATION REVIEW		10.0	05NOV84 308.0	16NOV84 319.9	13NOV84 316.0	26NOV84 329.9	6.0	6.0	

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NETWORK @@WPMN1 ON VOL200

VERSION : VS-20005 08-0823

LAST UPDATE : 25/09/1984

WEDNESDAY SEPTEMBER 26, 1984 3:27 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

** MILESTONE REPORT **

STRATPLAN
MISSION 1 WORD PROCESSING (KPG)
REPORT SERIES 1500

USER CTW PAGE 1

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 03/01/1984

CREATED ON : 04/01/1984

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: ACTIVITY NUMBER

MIL. NO.	ACT. NO.	ACT. CODE	ACTIVITY DESCRIPTION	NETWORK DATES START	NETWORK DATES FINISH	MILESTONE DATE	S/F CODE	- OVER + UNDER	* IF OVER
15	7950		WP OPERATIONAL IN FIRST NO	04OCT84	04OCT84	02/07/1984	S	-94.0	**

COMMENT : CURRENTLY DUE TO INDUSTRIAL DISPUTE

Department of Social Security
Canberra,Australia

NETWORK @@WPHN1 ON VOL200

VERSION : V8-20005 08-0823

LAST UPDATE : 25/09/1984

WEDNESDAY SEPTEMBER 26, 1984 3:28 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

DAILY BAR CHART

STRATPLAN
MISSION 1 WORD PROCESSING (KPG)
REPORT SERIES 2300

USER CTW PAGE 1

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 03/01/1984

CREATED ON : 04/01/1984

PROJECT DURATION= 329

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SORT: EARLY START, ACTIVITY NUMBER

RANGE : 259 TO 329.9

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NO. ACTIVITY DESCRIPTION												
4200 IRD RELATION	PPPPP	PP****	**									
7380 DEV PROCEDURES & ESTAB MAINTENANCE	PPPPP	PP****	****	*****	*****	*****	*					
9000 ONGOING IMPLEMENTATION	PPPPP	PP****	****	*****	*****	*****	*****	*****	*****	*****	*****	****
8100 PROGRAM & SYSTEMS TEST ENHANCEMENTS		PP****	****	*****								
7360 MONITOR DEV OF DOWNLINE LOADING		***	****	*****	*****	***						
7950 WP OPERATIONAL IN FIRST NO			*									
8200 INTEGRATION TEST ENHANCEMENTS					*****	*****	*****	*****				
9500 POST IMPLEMENTATION REVIEW								+++++	+++++			
8300 INSTALL ENHANCEMENTS									*****	*****		
999999 NETWORK FINISH	:	:	:	:	:	:	:	:	:	:	:	:
8400 NEW RELEASE OF SOFTWARE IN PRODUCTN										+	*	

KEY	
SYMBOL	INDICATES
*	CRITICAL ACT.
+	NON-CRITICAL ACT.
=	FREE FLOAT
-	TOTAL FLOAT
C	COMPLETED ACT.
P	ACT. IN PROGRESS
#	ACT. OUT OF SEQ.

Department of Social Security
Canberra,Australia

NETWORK @@WPNM1 ON VOL200

VERSION : VS-20005 08-0823

LAST UPDATE : 25/09/1984

WEDNESDAY SEPTEMBER 26, 1984 3:27 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY
** TIME ANALYSIS **

STRATPLAN
MISSION 1 WORD PROCESSING (KPG)
REPORT SERIES 2500

USER CTW PAGE 1

P MANAGMNT

STATUS : PROCESSED

PROJ. STARTS : 03/01/1984

CREATED ON : 04/01/1984

SELECT: ACTIVITY NUMBER = 1, REMAINING DURATION = 1.0

SORT: ACTIVITY NUMBER

CURRENT COMPLETION DATE : 26/11/1984

ACT. NO.	ACTIVITY DESCRIPTION	ACT. CODE	L.R.E. DUR.	EARLY START	EARLY FINISH	LATE START	LATE FINISH	FLOAT FF	FLOAT TF	INDICATOR * IF CRIT.
	'1' = ACTUAL DATE '2' = USE AS ACTUAL DATE			'3' = NOT EARLIER THAN		'4' = NOT LATER THAN				
4200	IND RELATION		131.0	03JAN84 A 1.0	03OCT84 275.9	03JAN84 A 1.0	03OCT84 275.9	0.0	0.0	***
7360	MONITOR DEV OF DOWNLINE LOADING		20.0	26SEP84 268.0	24OCT84 296.9	26SEP84 268.0	24OCT84 296.9	0.0	0.0	***
7380	DEV PROCEDURES & ESTAB MAINTENANCE		25.0	29JUN84 A 179.0	29OCT84 301.9	29JUN84 A 179.0	29OCT84 301.9	0.0	0.0	***
7950	WP OPERATIONAL IN FIRST RO		1.0	04OCT84 276.0	04OCT84 276.9	04OCT84 276.0	04OCT84 276.9	0.0	0.0	***
8100	PROGRAM & SYSTEMS TEST ENHANCEMENTS		14.0	24SEP84 A 266.0	12OCT84 284.9	24SEP84 A 266.0	12OCT84 284.9	0.0	0.0	***
8200	INTEGRATION TEST ENHANCEMENTS		20.0	15OCT84 287.0	09NOV84 312.9	15OCT84 287.0	09NOV84 312.9	0.0	0.0	***
8300	INSTALL ENHANCEMENTS		10.0	12NOV84 315.0	23NOV84 326.9	12NOV84 315.0	23NOV84 326.9	0.0	0.0	***
8400	NEW RELEASE OF SOFTWARE IN PRODUCTN		1.0	26NOV84 329.0	26NOV84 329.9	26NOV84 329.0	26NOV84 329.9	0.0	0.0	***
9000	ONGOING IMPLEMENTATION		120.0	17SEP84 A 259.0	04MAR85 427.9	17SEP84 A 259.0	04MAR85 427.9	0.0	0.0	***
9500	POST IMPLEMENTATION REVIEW		10.0	05NOV84 308.0	16NOV84 319.9	12NOV84 315.0	23NOV84 326.9	0.0	5.0	
999999	NETWORK FINISH		1.0	19NOV84 322.0	19NOV84 322.9	26NOV84 329.0	26NOV84 329.9	5.0	5.0	

MAPPS CHANGES 27/9/84

A. MAINFRAME INSTALLATION PROJECTS

1 JOB 1001 REMOVE 8x8650 NCCB has been completed.

2 JOB 990 DEL/INST/ACC 6x8380 + CNTLR NCC has started

3 Due to delays in the signing of contracts for equipment the following jobs have been delayed until 4 February 1985

JOB 1480 DEL/INST LINE MONITOR EQUIP NSW

JOB 1490 DEL/INST MATRIX SWITCH EQUIP NSW

4 JOB 1500 DEL/INST MISC COMMS EQUIP NSW has been extended and will now complete 4 October 1985.

5 JOB 810 ACCEPTANCE TEST PREP QLD has been completed.

6 JOB 820 ACCEPT M/F EQUIPMENT QLD commenced this week.

7 JOB 1220 CONV PROD SYSTEM TO MVS SA has been completed.

8 In order for acceptance tests for the mainframe equipment and the ATL to be carried out concurrently the following jobs have been put forward a week.

JOB 1410 DEL/INST M/F EQUIP SA now due to start 18 March 1985.

JOB 1420 ACCEPT TEST PREP SA now due to start 8 April 1985.

JOB 1430 ACCEPT M/F EQUIP SA now due to start 29th April 1985.

9 The following jobs have been completed

JOB 870 DELIVER/INSTALL M/F EQUIP TAS.

JOB 1600 DEL/INST RAYTH CONSOLE EQUIP TAS.

10 The industrial dispute in Melbourne continues to be unresolved and site preparation is not likely to be finished before 1 February 1985. The following jobs have therefore been provisionally rescheduled.

JOB 900 SITE PREPARATION VIC now (hopefully) due to complete 1 February 1985.

JOB 910 COMPUTER ROOM CLEANUP VIC to start 4 February 1985.

JOB 930 ENVIRONMENT STABILISATION VIC to start 11 February 1985.

JOB 920 DELIVER/INSTALL ATL VIC to start 11 February 1985.

JOB 1650 DEL/INST RAYTH CONSOLE EQUIP VIC to start 25 February 1985.

JOB 940 DELIVER/INSTALL MF EQUIP VIC to start 25 February 1985.

JOB 950 ACCEPTANCE TEST PREP VIC to start 18 March 1985.

JOB 960 ACCEPT MF EQUIP VIC to start 1 April 1985.

JOB 1370 ATL ACCEPTANCE TEST VIC to start 1 April 1985.

JOB 1090 TRANS PRODUCTION TO NEW MACHINE VIC to start 22 April 1985.

11 JOB 1060 DEL/INST RAYTHEON MVS CONSOLE WA has been completed.

8 5 YEAR INSTALLATION PLAN

Due to industrial dispute in Melbourne the following are the provisionally rescheduled dates

1 JOB 160 VICTORIAN MAINFRAME SITE PREP now due to complete 1 February 1985.

2 JOB 170 VIC M/F INSTALL/ACCEPT TEST now due to start 24 February 1985.

Department of Social Security
Canberra,Australia

NETWORK REINSTWN OF VOL200

VERSION : Ver 3.21 1122

LAST UPDATE : 30/06/1983

WEDNESDAY SEPTEMBER 26, 1984 3:45 PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

WEEKLY BAR CHART

STRATPLAN
MAINFRAME 5 YEAR INSTALLATION PLAN
REPORT SERIES 2300

USER C16 PAGE 1 Department of Social Security
Canberra,Australia

27/09/1984

STATUS : PROCESSED NETWORK REINSTWN OF VOL200

PROJ. STARTS : 01/07/1983 VERSION : Ver 3.21 1122

CREATED ON : 15/05/1984 LAST UPDATE : 30/06/1983

PROJECT DURATION= 1223

WEDNESDAY SEPTEMBER 26, 1984 [illegible] PM

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

WEEKLY BAR CHART

STRATPLAN
MAINFRAME 5 YEAR INSTALLATION PLAN
REPORT SERIES 2300

SELECT: ACTIVITY NUMBER = 1

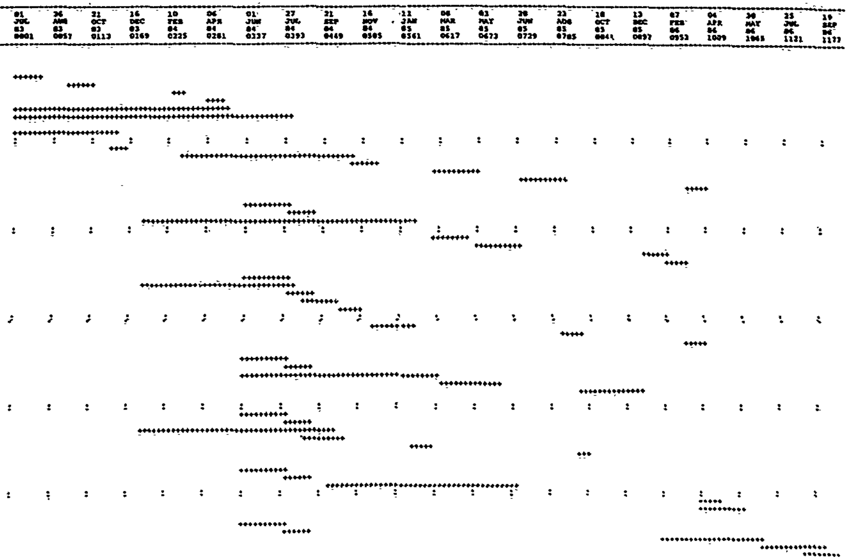
SORT: ACTIVITY CODE POSITION 1, EARLY FINISH, EARLY START

RANGE : 1 TO 1223.9

SELECT: ACTIVITY NUMBER = 1

SORT: ACTIVITY CODE POSITION 1, EARLY FINISH, EARLY START

RANGE : 1 TO 1223.9



NO. ACTIVITY DESCRIPTION
1 ************* A.C.T. ***************
10 CO MAINFRAME SITE PREP
30 CO M/F INST ACCP TESTS
50 SITE PREP 2ND CPU
60 2ND CPU INSTAL/ACCEPT TEST
30 CO 13 UI'S SITE PREP
40 CO UI'S INSTALLATION
2 ************ N.S.W. ***************
80 NSW MAINFRAME SITE PREP

90 NSW M/F INSTAL/ACCEPT TEST
100 NSW INSTAL GROUP 1 UI'S
110 NSW INSTAL GROUP 2 UI'S WANGS
120 NSW INSTAL GROUP 2 UI'S
130 NSW INSTAL GROUP 3 UI'S
140 NSW INSTAL REMAINING UI'S
3 *********** VICTORIA ***************
210 VIC 2ND WP FAC (1) SITE PREP
220 VIC 2ND UI'S INST (1)
160 VIC MAINFRAME SITE PREP

170 VIC M/F INSTAL/ACCEPT TEST
180 VIC INSTAL GROUPS 1 & 2 UI'S
190 VIC INSTAL GROUP 3 UI'S
200 VIC INSTAL GROUP 4 UI'S
4 ************ QUEENSLAND ************
290 QLD 2ND WP FAC (1) SITE PREP
240 QLD MAINFRAME SITE PREP
300 QLD 2ND WP INST (1)
250 QLD M/F INSTAL/ACCEPT TEST
255 QLD PREP FOR PROD

260 QLD INSTAL GROUP 1 UI'S
270 QLD INSTAL GROUP 2 UI'S
280 QLD INSTALL REMAINING UI'S
5 ********** SOUTH AUSTRALIA **********
360 SA 2ND WP FAC (1) SITE PREP
360 SA 2ND UI WP INST (1)
320 SA MAINFRAME SITE PREP
330 SA M/F INSTAL/ACCEPT TEST
340 SA UI'S INSTALLATION
6 ************ TASMANIA ***************

420 TAS 2ND WP FAC (1) SITE PREP
430 TAS 2ND UI WP INST (1)
380 TAS MAINFRAME SITE PREP
390 TAS M/F INSTAL/ACCEPT TEST
400 TAS INSTAL GROUP 1 UI'S
410 TAS INSTAL REMAINING UI'S
7 ******* NORTHERN TERRITORY ********
480 NT 2ND WP FAC (1) SITE PREP
490 NT 2ND UI WP INST (1)
440 NT REMOTE PWP SITE PREP

450 NT UI'S INSTALLATION
460 NT REMOTE PWP ACCEPT TEST
8 ********* WESTERN AUSTRALIA ********
540 WA 2ND WP FAC (1) SITE PREP
550 WA 2ND UI WP INST (1)
500 WA MAINFRAME SITE PREP
510 WA M/F INSTAL/ACCEPT TEST
520 WA UI'S INSTALLATION
99999 NETWORK FINISH

Department of Social Security
Canberra, Australia

NETWORK: SPHFINST ON VOL300.

VERSION : Ver 3.23 1215

LAST UPDATE : 05/06/1983

** PROJECT MANAGEMENT SYSTEM **
DEPARTMENT OF SOCIAL SECURITY

WEEKLY BAR CHART

STARTPLAN
MAINFRAME INSTALLATION SCHEDULE
REPORT SERIES 2300

USER C16 PAGE 1

27/09/1984

STATUS : PROCESSED

PROJ. STARTS : 06/06/1983

CREATED ON : 27/06/1984

PROJECT DURATION= 1311

SELECT: EARLY FINISH = 01/08/1984, ACTIVITY NUMBER 999999

SORT: ACTIVITY CODE POSITION 1, EARLY START, EARLY FINISH, ACTIVITY NUMBER

RANGE : 365 TO 974

04 JUN 84 0265	30 JUL 84 0421	24 SEP 84 0477	19 NOV 84 0533	14 JAN 85 0589	11 MAR 85 0645	06 MAY 85 0701	01 JUL 85 0757	26 AUG 85 0813	21 OCT 85 0869	1

NO.	ACTIVITY DESCRIPTION
1	********** A.C.T. **********
1002	ACCEPT : 3 X 8380 MCC.....CO
1001	REMOVE 8 X 8650 MCC8.....CO
980	DEL/INST/ACC 6 X 8380+CMTLR MCC...CO
1670	RELOCATE 6X8650 + CMTLR TO VIC CO
1680	REMOVE 8X8650 FROM MCC ACT.....CO
1730	DEL/INST/ACCEPT 2 X 8380 MCC.....CO
2	********** N.S.W. **********
1470	DELIVER/INSTALL DEMUX EQUIP NSW...SS
1500	DEL/INST MISC COMMS EQUIP NSW.....SS
540	SIT UP PROBLEM MANAGEMENT NSW.....SC
1480	DEL/INST LINE MONITOR EQUIP NSW...SS
1490	DEL/INST MATRIX SWITCH EQUIP NSW...SS
3	********** QUEENSLAND **********
750	SITE PREPARATION QLD.....SP
770	COMPUTER ROOM CLEANUP QLD.....SP
790	ENVIRONMENT STABILISATION QLD...SP
1550	DEL/INST RAYTH CONSOLE EQUIP QLD...SS
800	DEL/INSTALL HF EQUIP QLD.....SR
780	DELIVER/INSTALL ATL QLD.....SR
810	ACCEPTANCE TESTING PREP QLD.....NS
820	ACCEPT HF EQUIPMENT QLD.....NS
1390	ATL ACCEPTANCE TEST QLD.....SR
1070	TRANS PRODUCTION TO NEW MACHINE...SR
1520	DEL/INST LINE MONITOR EQUIP QLD...SS
1530	DEL/INST MATRIX SWITCH EQUIP QLD...SS
1540	DEL/INST MISC COMMS EQUIP QLD.....SS
1910	DELIVER/INSTALL DEMUX EQUIP QLD...SS
4	********** SOUTH AUSTRALIA **********
1380	SITE PREPARATION SA.....SP
1050	MVS TRAINING SA.....TR
1200	MOUNT MVS SYSTEM SA.....MS
1210	LOCAL TRAINING MVS SA.....MS
1220	CONV PROD SYSTEM TO MVS ADELAIDE..MS
1390	COMPUTER ROOM CLEANUP SA.....SP
1460	DEL/INST/ACCEPT DIESEL GEN SA.....AD
1710	DEL/INST LINE MONITOR EQUIP SA...SS
1720	DEL/INST MATRIX SWITCH EQUIP SA...SS
1730	DEL/INST MISC COMMS EQUIP SA.....SS
1700	DELIVER/INSTALL DEMUX EQUIP SA....SS
1400	DEL/INSTALL ATL SA.....AD
1450	MONAMY/HOMEWELL INST/COMS SA.....AD
1410	DEL/INSTALL H/F EQUIP SA.....AD
1420	ACCEPT TEST PREP SA.....AD
1690	ATL ACCEPTANCE TEST SA.....NS
1430	ACCEPT H/F EQUIP SA.....AD
1440	TRANS PROD TO NEW MACH SA.....AD
5	********** TASMANIA **********
830	SITE PREPARATION TAS.....SP
1030	MVS TRAINING TAS.....TR
840	COMPUTER ROOM CLEANUP TAS.....SP
860	ENVIRONMENT STABILISATION TAS....SP
1660	DEL/INST RAYTH CONSOLE EQUIP TAS..SS
870	DELIVER/INSTALL HF EQUIP HOBART...NS
880	ACCEPTANCE TEST PREP TAS.....NS
850	DELIVER/INSTALL ATL TAS.....NS
890	ACCEPT HF EQUIPMENT TAS.....NS
1080	TRANS PRODUCTION TO NEW MACHINE...NS
1360	ATL ACCEPTANCE TEST TAS.....NS
1570	DEL/INST LINE MONITOR EQUIP TAS...SS
1580	DEL/INST MATRIX SWITCH EQUIP TAS..SS
1590	DEL/INST MISC COMMS EQUIP TAS.....SS
1560	DELIVER/INSTALL DEMUX EQUIP TAS...SS
6	********** VICTORIA **********
900	SITE PREPARATION VIC.....SP
1040	MVS TRAINING VIC.....TR
1190	CONV PRODUCTION SYSTEM TO MVS.....MS
910	COMPUTER ROOM CLEANUP VIC.....SP
920	ENVIRONMENT STABILISATION VIC....SP
920	DELIVER/INSTALL ATL VIC.....ML
1650	DEL/INST RAYTH CONSOLE EQUIP VIC..SS
940	DELIVER/INSTALL HF EQUIP VIC.....ML
950	ACCEPTANCE TEST PREP VICS.....ME
1610	DEL/INST LINE MONITOR EQUIP VIC...SS
1620	DEL/INST MATRIX SWITCH EQUIP VIC..SS
1640	DEL/INST MISC COMMS EQUIP VIC.....SS
1610	DEL/INST DEMUX EQUIP VIC.....SS
968	ACCEPT HF EQUIPMENT VIC.....ML
1370	ATL ACCEPTANCE TEST VIC.....ML
1080	TRANS PRODUCTION TO NEW MACHINE...ML
7	********** WESTERN AUSTRALIA **********
1040	MVS TRAINING WA.....TR
1660	DEL/INST RAYTHEON MVS CONSOLE.WA..SS
1230	MOUNT MVS SYSTEM WA.....MS
1240	LOCAL TRAINING MVS WA.....MS
1250	CONV PROD SYSTEMS/MVS WA.....MS
1730	DEL/INST LINE MON EQUIP WA *1986*.SS
1760	DEL/INST MATRIX SWITCH WA.*1986*..SS
1770	DEL/INST MISC COMMS EQUIP WA 1986.SS
1740	DEL/INST DEMUX EQUIP WA *1986*....SS

Occupational Health and Safety Aspects of VDU Use Volume 2—Appendices to First Report

Appendices to Report

225

Joint Committee of Public Accounts

Parliament of the Commonwealth of Australia 1984

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

JOINT COMMITTEE OF PUBLIC ACCOUNTS

APPENDICES TO REPORT 225

OCCUPATIONAL HEALTH AND SAFETY ASPECTS OF VDU OPERATION

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DUTIES OF THE COMMITTEE

Section 8.(1) of the Public Accounts Committee Act 1951 reads as follows:

Subject to sub-section (2), the duties of the Committee are:

(a) to examine the accounts of the receipts and expenditure of the Commonwealth including the financial statements transmitted to the Auditor-General under sub-section (4) of section 50 of the Audit Act 1901;

(aa) to examine the financial affairs of authorities of the Commonwealth to which this Act applies and of intergovernmental bodies to which this Act applies;

(ab) to examine all reports of the Auditor-General (including reports of the results of efficiency audits) copies of which have been laid before the Houses of the Parliament;

(b) to report to both Houses of the Parliament, with such comment as it thinks fit, any items or matters in those accounts, statements and reports, or any circumstances connected with them, to which the Committee is of the opinion that the attention of the Parliament should be directed;

(c) to report to both Houses of the Parliament any alteration which the Committee thinks desirable in the form of the public accounts or in the method of keeping them, or in the mode of receipt, control, issue or payment of public moneys; and

(d) to inquire into any question in connexion with the public accounts which is referred to it by either House of the Parliament, and to report to that House upon that question,

and include such other duties as are assigned to the Committee by Joint Standing Orders approved by both Houses of the Parliament.

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INTRODUCTION

In the course of the Committee's hearing into the ADP re-equipment program of the Department of Social Security, known as Stratplan, it became clear that there were issues of health and safety which had not been addressed. These issues which covered repetitive strain injuries, eyesight testing and radiation emission are common to all organisations using visual display units.

The Committee believed it was important to reproduce a number of documents received in the course of the inquiry as appendices to our main report on STRATPLAN in a separate volume so that a wider group of interested bodies may have access to the information that was made available to the Committee During its hearings into the Stratplan project. This document was not designed to cover all the literature on the vital subject of health and safety, nor are the attachments judged to be the most current or learned in this field.

In the public service environment, the Public Service Board (PSB) has a specific role to inform Departments of the policies laid down by the National Health and Medical Research Council (NH & MRC). The Council's guide on Visual Display Units appears in Appendix 3. Many Departments and agencies, however, have developed separate policies which differ in content and context. They range from 'noticeboard type' instructions to fully researched and dynamically applied practices. Samples of these are included, but the Committee wishes to thank those who either sent copies of their procedures or made submissions. Those that have been omitted were done so only because of space considerations.

Similarly, it has not been possible to include all submissions from staff association. Those from the Administrative and Clerical Officers Association (ACOA), Australian Public Service Association (APSA) and the Australian Council of Trade Union Organisations (ACTU) are attached in Appendix 5.

The Public Service Board, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Telecom sent copies of their policies and practices to the Committee. The Telecom edition is an interim guide which, to date, has not been accepted by the staff association. These documents appear in Appendix 4.

Details of legislative provisions for the health and safety of VDU operators appear in Appendix 1. The likely role of the National Occupational Health and Safety Secretariat in the issues canvassed in the attached documents is discussed in Appendix 2.

During the hearing, interest was shown in eyesight testing, radiation emission and repetitive strain injuries. Some literarure which was considered by the Committee is listed in Appendix 7. Appendix 8 contains details of overseas practice for eyesight testing.

Finally, the Committee received an immense amount of documentation on work practices, radiation problems and eyesight testing from Australian and overseas organisations. These are listed in Appendix 9.

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LEGISLATION

INDUSTRIAL FOUNDATION FOR ACCIDENT PREVENTION

CONFERENCE ON LAW REFORM IN OCCUPATIONAL SAFETY AND HEALTH

PERTH, 22 FEBRUARY 1984

OCCUPATIONAL SAFETY AND HEALTH : REFORM ISSUES

THE HON JUSTICE M D KIRBY CMG
CHAIRMAN OF THE AUSTRALIAN LAW REFORM COMMISSION

TWO OPPORTUNITIES

Judges,at least sitting alone,rarely get two chances. If they get it wrong, there is usually an appeal court which, with brutal all-seeing wisdom,will get it right. Similarly, all too many industrial accidents and problems of occupational health, give no second chance. A moment's mistake or bad industrial design, and the employee and his family may for years suffer the blight of injury and disease -- even death.

On this occasion, I do get a second chance. My task at the outset of this afternoon session is to offer a brief 'backdrop' for the issues of law reform in occupational safety and health in Australia - and indeed beyond. Many of the themes will already have emerged from the morning's presentations. In fact, the perceptive among you will already have seen how reform of the law and of social practices governed by the law tends to come in waves. So it is with mental health law reform. ne wave took us out of the punitive lunatic asylums. A new wave is now proposing stricter definitions, better procedures and emphasis upon deinstitutionalisation of care.

So too it was in divorce law. I am old enough to remember the snoops and spies, the bedroom raids and the scandal newspapers. But a great wave of reform began in Scandinavia with the adoption of a new principle based on respect for individual relationships. If a

marriage had irretrievably broken down, the parties should not be forced to live together against their will. That wave reached Britain. Reforms in Britain were ultimately copied in Australia and other common law countries. There are many other illustrations of developments of this kind.

For present purposes we are seeing a like phenomenon in safety legislation. Until quite recently, the basic structure of Australia's safety legislation traced its origins directly to English Factory Acts, supplemented by a hotchpotch of highly specific, ad hoc bits and pieces -- enacted to meet immediate problems, as they were perceived. The Robens Committee, appointed in the United Kingdom in 1970, condemned this legislative approach:

> Present regulatory provisions follow a style and pattern developed in an earlier and different social and technological context. Their piecemeal development has led to a haphazard mass of laws which is intricate in detail, unprogressive, often difficult to comprehend and difficult to amend and keep up to date. It pays insufficient regard to human and organisational factors in accident prevention, does not cover all work people and does not deal comprehensively and effectivoly with some sources of serious hazard. These defects are compounded and perpetuated by successfuly fragmented administrative arrangements.[1]

NEW SAFETY LAW

As a result of the Robens Committee report, the Health and Safety at Work Act 1974 was passed in the United Kingdom. It became the principal model (supplemented by models in the United States and Canada) for reform in our country. Interestingly enough, as in the case of divorce, many of the ideas adopted by Robens derived from Scandinavia. No doubt because they cannot spend so much time

in sybaritic existence on the beach, our Scandinavian friends find the opportunity to reflect more than we do on the improvement of their society. However that may be, legislation based on the Robens model was introduced in Victoria in 1981[2], in South Australia in 1972,[3] and in Tasmania in 1977.[4] The Robens model also profoundly influenced the Occupational Health and Safety Act 1983 of New South Wales. Its influence can be seen quite clearly in the discussion document so commendably issued by the West Australian Government as a prelude to legislation in this State.[5] I say commendably because the whole methodology of the Australian Law Reform Commission is too dedicated to the principle of public and expert consultation on important issues of legislative policy before measures are introduced into Parliament. We should see more of this. I congratulate the Minister, Mr. Dans and the Industrial Foundation for Accident Prevention for providing this opportunity to focus our minds on the legislative way ahead.

Some things seem clear from a consideration of the Scandinavian, British and North American experience:

* The costs of accident and disease are under-measured, often hidden but clearly high in economic and human terms.
* As Premier Brian Burke has said, the legislative approach of the past has tended to concentrate on safety and accidents to the neglect of occupational health and work-related illnesses.[6]
* He also pointed out that in times of economic downturn there is a tendency not to press safety issues. Yet in terms of costs and benefits for the nation as a whole, investment in occupational health and safety can often pay high dividends.

* Clearly, in Western Australia as in all other States, efforts should be made to reduce the proliferation of legislation. The discussion document cites 44 statutes and 58 regulatory provisions governing industrial safety in Western Australia alone.[7] Much of it is 'anachronistic and fragmented'. The effort is now on to provide umbrella legislation with a number of clearly stated general principles, improved consultative machinery and enhanced on site organisation to provide a new focus for an attack on avoidable accidents and illnesses.

LEGISLATIVE SETTING

Our legal system, inherited from Britain, relies partly on common law principles developed by the judges. These will remain in the backdrop against which new and old legislation will operate. Geoffrey Miller, Q.C. will develop in his paper the way in which the courts have been contributing pressure for work health and safety, by decisions which assign responsibility for compensation when things go wrong. But we should not deceive ourselves that tidying up the statute book, creating councils and work committees or even enacting new legislative obligations and increasing fines will provide the entire answer to reducing avoidable work-related disabilities. There is a touching faith in some quarters that the enactment of laws has an immediate and precise impact on social behaviour. It is not so. Law reform can only be one part of the mosaic of a broadly based community response to the problems we are addressing. You should keep in mind the limitations of the law as an instrument of social control and reform, as you listen to the papers in this session. By all means we should:

* enact comprehensive legislation on industrial safety

* establish commissions and councils for tripartite consultation;

* set up advisory committees to investigate specialist problems;
* improve the inspectorate and administration of the legislation;
* enhance the powers of inspectors, including to give notices, on-the-spot fines and even injunctions against particularly unsafe practices;
* appoint work committees, constantly to monitor safety questions;
* perhaps even, as in Canada, confer a statutory right, without penalty, to stop work in the face of perceived danger to safety or health;
* enhance education, training and research on safety questions.

All of these are important things which the law can facilitate. But getting into the minds of the employer and the employee, overcoming the traditional complacency and acceptance of unions, employer bodies, judges and administrators - this requires more than the enactment of a law or two.

It is here that the work of the Industrial Foundation for Accident Prevention is specially useful. The media too is vitally important to counter apathy and unenlightenment. Positive attitudes by employers and employees alike in particular institutions and the realisation that attention to safety and health can be cost-effective — these are things that no statute can enact.

The legislative reforms for better health and safety laws in Australia are now coming like a wave. One of the advantages of a federation is that we can learn from each other and copy each other when things are well done. The way of safety legislation is itself only part of the relevant background to be kept in mind. Also vitally important are the current moves to no-fault accident compensation reforms[8] and the still smouldering debate about industrial democracy. Worker partication on

governing boards is so far, in Australia, a phenomenon only of the public sector. But I believe it will come to private corporation in due course, as it has in Scandinavia and Germany. It will bring with it a heightened realisation that employing enterprises represent a community of interests with just as much proper concern for shareholders' profits as for the safety and health of those who devote their daily lives to the success of the enterprise.

As any good lawyer should, I have now strayed beyond my allotted ten minutes. My chairmanly code, which I now annouce, is simple. I will allow no similar lattitude to following speakers that I have just extended to myself. At the end of the session, my task will be to draw to your attention a number of key issues which require your consideration and the consideration of those whom we have elected to do something about the vitally important national problem we are here to discuss.

FOOTNOTES

* Views presented are personal viewsonly. The Australian Law Reform Commission has no reference on the subject of industrial health and safety as such.

1. Robens Committee, cited in F Marks and J M Churchill, 'Understanding the Occupational Health and Safety Act,' 1983 (NSW), CCH, 1983, viii.

2. Industrial Safety, Health and Welfare Act 1981 (Vic).

3. Industrial Safety, Health and Welfare Act 1972 (SA).

4. Industrial Health, Safety and Welfare Act 1977 (Tas).

5. Western Australia, Occupational Health, Safety and Welfare Legislation: A Public Discussion Document, issued by Mr D K Dans MLC, Minister for Industrial Relations, October, 1983.

6. B Burke, Address at the Opening of Industrial Safety Week 1983 in IFAP Bulletin, Feb-April 1983, 15.

7. Western Australia, Discussion Paper, n.5 above, 9.

8. See (1984) Reform 13; New South Wales Law Reform Commission, Working Paper, Transpc - Accidents Scheme for NSW, 1983. See also (1983) Reform 105.

INDUSTRIAL FOUNDATION FOR ACCIDENT PREVENTION

CONFERENCE ON LAW REFORM IN OCCUPATIONAL SAFETY AND HEALTH

PERTH, 22 FEBRUARY 1984

WORK HEALTH AND SAFETY : THE KEY ISSUES

The Hon Justice M D Kirby CMG
Chairman of the Australian Law Reform Commission

MATTERS BEYOND DISPUTE

I now come to my second 'performance'. I am listed to speak on the subject 'practicable activities for direct and early impact on occupational safety and health policies'. This somewhat cumbersome topic was so inelegant that I decided not to adopt it. Indeed, with the arrogance that is only possible if you are a judge, I have decided to focus my attention somewhat more narrowly. I am a lawyer. I have already announced my reservations about the role of the law in promoting occupational safety and health. I repeat my caution against over-estimating the impact at the workface of organisational, legislative and bureaucratic rearrangements. We should not deceive ourselves that there is a panacea to be found in legislation that will, if only we can get the words right, provide instant relief to the pain and suffering of occupational injury and disease.

Yet once I stray outside the narrow confines of the law, I am no expert. There are many in this room who would have far greater qualifications (or access to people with such qualifications) to speak of work face initiatives to improve occupational safety and health. Lawyers are good for limited things. Some unkind spirits even doubt that assertion. But it is a good lawyer who realises the frontiers of his craft. It is not for me to speak about the very practical changes that can be introduced in the workplace to reduce the risks of accident or disease or to minimise their impact. You would do better in this regard to read carefully the

the bulletin of the Industrial Foundation for Accident Prevention or other expert journals with practical advice on in-house safety. For example, recent articles in this bulletin, which I have seen, deal with such highly practical topics as:

* the design of VDUs to reduce work-related disabilities[1];
* the improvement of investigation of injuries in order to isolate causes and prevent recurrences[2];
* better induction of new employees so that health and safety procedures are understood by them from the very outset[3];
* provision of safety consultation on such matters as noise control, personal protective equipment and so on.[4]

It is clear from the literature and from a reflection on the increasing moves of our community into the new technology of informatics that fresh attention must be paid to the implications of new technology for work health and safety. Just as Premier Burke warned us against neglecting problems of occupational health, he also offered a warning against stereotyping occupational problems in terms of heavy industry and dangerous machinery in large factories. True it is, these problems remain with us. But as an increasing proportion of our work force moves into the information and service sector, it is important that our policies and laws should deal with the community we have and the occupational health and safety problems of today[5]. In this new world, as Mr. Burke has pointed out, stress and alienation may be just as real a problem for the employee as the visible frank physical injuries of the past. It may be more difficult to perceive and diagnose psychological dislocation or tenosynovitis. But from the point of view of the victim and of the employer and the economy, the problem is just as real and serious.

A CHECKLIST

In these closing remarks, I have decided not to venture a detailed proposal for top priorities of the workface reforms. I will leave that to the

experts. Nor do I propose to go over what I take to be the common ground in the current wave of legislative reform on this topic, passing through Australia. Clearly this includes:

* enactment of new comprehensive legislation to state the goals and to establish new machinery;
* setting up of tripartite commissions or councils to provide a new focus for future legilsation, administrative policies, research and education;
* establishment of specialist advisory committees on topics requiring highly specific attention;
* improvement of the administration of health, safety and welfare legislation;
* enhancement of the numbers and powers of inspectors charged with the monitoring, supervision and enforcement of the law;
* imposition of certain new duties on employers and employees alike in the defence of health and safety;
* provision of defences against legal proceedings where it can be shown that the employer was not reasonably at fault;
* establishment of systems of safety representation including, in appropriate cases, the creation of work committees;
* the devotion of more funds to education, training and research;
* new attention to compensation laws so that these are more closely aligned with the policies of rehabilitation. All too often, the interposition of insurance has reduced the pressure upon employers to improve their work situation. It has also led to unhealthy cross-subsidisation by safe employers of those who are indifferent to occupational health and safety.[6]

Instead of going over this territory, which seems now to be generally agreed by most observers, I propose to endeavour to identify the areas of disagreement in the Australian debate. It is this that should have our primary attention.

MATTERS IN CONTROVERSY

General legislation. The first contentious question about the design of new legislation on occupational safety and health is the extent to which it should replace and substitute for the plethora of old statutory and common law principles that have grown up since the Industrial Revolution. Indicative of the problem is the fact that, despite the variety, copious length and detail of much existing State legislation, very large proportions of working population still fall outside its protection, in practice. For example, it has been estimated that 1.5 million employees in New South Wales had no real legal coverage in respect of occupational health and safety legislation prior to the 1983 Act. It was pointed out that the figure represented approximately two-thirds of the New South Wales work force.[7] It is a figure that bears out Lord Robens' comment that the law simply failed to keep up with the technology of employment.

The Williams Report on Occupational Safety and Health in New South Wales, which preceded the 1983 legislation, called attention to at least 26 major statutes relevant to occupational safety and health. Just to name the legislation gives an indication of the specificity of the approach that has been taken to date. It includes the Aerial Spraying Control Act; the Liquified Petroleum Gas Act; the Pesticides Act; the Radiocative Substances Act; and the Workers' Compensation (Brucellosis) Act. Of course, in addition to the statutes of limited application, there were others of more general operation, including notably the Workers' Compensation Act.

Under the 1983 NSW legislation, one of the objects is eventually to replace the 26 individual statutes (or parts of them) so that, in due course

of time, a single law will contain, in effect, a codification of all occupational health and safety legislation operating in the State. This aim is to be achieved by the vehicle of regulations which will, in turn, incorporate the detail of relevant existing legislative provisions[8]. One question that must be faced by reforming legislators at this time is the extent to which the objectives cited by Robens and Williams can best be achieved by leaving on the statute books (as a companion to the new general legislation) the statutory obligations of the past. Of course, no-one would suggest the sudden repeal of important and carefully focused statutes, at least until appropriate substitute legislation was in place. But it is probably fair to say that enacting a general law (even one which takes precedence over the special laws of the past) and leaving those special laws on the books, is a formula for confusion, a lawyer's delight in working out the interaction between the statutes, an obfuscation of the statutory intent and a deviation from the professed objection to get the legal act together. By obscuring the legislative message, the educative impact of simple laws may be lessened. The respective places of a general statute and the preserved pre-existing laws must be worked out with great care. But they must be worked out quickly lest pressure of work, apathy, present entrenched careers or other reasons intervene to frustrate the achievement of true law reform, whilst the enthusiasm for it exists.

Safety Committee.

Another controversy has surrounded the right to set up occupational health and safety committees. It will be recalled that this idea, generated in Scandinavia, was a central feature of the United Kingdom legislation. Its effectiveness as contributing to the reduction of work-related disease or injury, cannot yet be fully assessed. However, early reports from the United Kingdom provide some encouragement, just as one would expect. There is a good review on "Do joint health and safety committees work?" in a report of a study from the University of Glasgow published in the IFAP bulletin.[9] Again, the impact of institutional approaches should not be over-estimated,

nor should there be excessive optimism. Setting up a committee of itself does nothing. As pointed out in the article, much depends upon how the committee is organised, how frequently it meets, how management services it, how suggestions are carried into practical effect and so on. But it can at least be said that the idea appears to be having some impact.

Against this background, the issue arises as to whether there should be an absolute right in employees to have such a committee established. This was the view expressed by Mr. J D Garland, a former General-Secretary of the Amalgamated Metal Workers' and Shipwrights' Union and now a member of the Upper House of New South Wales in discussion on the 1983 NSW Bill.[10] That Bill confines the right to have an occupational health and safety committee established at a workplace to circumstances where either:

> (a) there are 20 or more persons employed ... and a majority ... requests the establishment of such a committee; or
>
> (b) the (Occupational Health, Safety and Rehabilitation Council of New South Wales) directs the establishment of such a committee at the place of work.[11]

A number of commentators, particularly from the union movement, expressed reservations about these qualifications to the right to a committee. They suggest that health and safety in small establishments is just as important as in large to the people involved, yet employees in such places may be vulnerable to pressure not to push the occupational health and safety angle.

Non English-speaking workers. Much attention has been given in the Australian debate to the special predicament of non English-speaking employees, particularly in heavy industry. Disappointment

has been expressed about the failure specifically to address special needs for instruction and education in health matters, a topic lately touched upon by Sir James Gobbo of the Supreme Court of Victoria.[12] On the other hand, Mr P D Hills, the NSW Minister for Industrial Relations and Technology, acknowledging the special vulnerability of employees not fluent in English, has said that they could be represented on the Council, on committees and on a special committee to be established as one of three standing statutory committees of the Council:

> The first committee will enable the Council to investigate and make recommendations on the problems of the migrant workforce. The second committee will concern itself with the rehabilitation of injured workers and handicapped persons. The third committee, as I previously mentioned, will be the committee on mining safety. As well, the Council may establish such other committees as it believes appropriate.[13]

Right to stop work. In certain circumstances the common law already protects a worker faced by dangerous or unhealthy work conditions to stop work.[14] On the other hand, in times of economic downturn, it is often difficult to enforce that right without fear of retaliation. An experienced industrial lawyer in New South Wales went so far as to say that he would 'swap the whole of the provisions of the proposed legislation (in the 1983 NSW Bill) for the right of workers to stop work to enforce safety provisions'.[15] Such a provision exists under certain Canadian legislation, guaranteeing workers the right to refuse without penalty work which is unsafe or unescapably dangerous to health. Of course, there are exceptions for 'normal dangers'

for cases where the risk is not directly to the worker in question or where the risk is very remote. There are also exceptions where the very nature of the work is dangerous (such as police, firefighters, correctional workers etc.). But the right to refuse and to compel management to rectify unsafe or unhealthy conditions is now a well developed right in North America. It is based on the principle that prevention is much more valuable than cure. In New South Wales, there was considerable discussion within the labour movement about the statutory enactment of a right to stop work for safety reasons, without retaliation. In the result, the provision was not included in the Bill. Its omission caused anxiety on the part of a number of Labor Members of the NSW Parliament. Clearly, this is an issue that will not go away.

Safety Onus. The recent NSW legislation imposed absolute and wide-ranging obligations on various persons. The main obligations imposed on employers are expressed in general terms. They have the effect of ensuring a guarantee of the health, safety and welfare work of all employees. The obligation extends also to the provision and maintenance of a working environment consonant with one of the expressed objects of the Act, namely 'to promote an occupational environment for persons at work which is adapted to their physiological and psychological needs'.[17]

A comparison between the legislation of the United Kingdom and that of the Australian States modelled on it, on the one hand, and the NSW Act, discloses that there is a choice to be made. The United Kingdom model imposes obligations in similar terms to those set out in the NSW Act except for what has been described as 'one distinct difference':[18]

> That other legislation expresses each obligation in terms that include the qualification 'so far as is reasonably practicable'. This allows for a consideration of factors pertaining to the manner

> and method of operation of a person's business or undertaking. It might be argued that (the NSW) Act achieves the same purpose because it allows for a consideration as to whether something was 'reasonably practicable' by way of the defence contained in s.53. The short answer to this is that whereas the safety legislation which exists in the United Kingdom and the other States of Australia presumes, like most criminal legislation, that a person is innocent until proven guilty, the manner in which(the NSW) Act is framed will have the effect of assuming that a person is guilty unless he proves that he is innocent. This is because the obligations contained in s.15-18 are framed in such wide terms and are so absolute in their expression, that it will be virtually impossible for any person subject to their terms to be able to escape a breach of these obligations in the case of an injury or some risk to health or safety'.[19]

This approach attracted opposition criticism to the NSW legislation when it was in Parliament.[20] It was asserted that only with good will of employers would the new legislation work. Certainly, the shifting of the onus is a significant legislative development. Generally it may be considered undesirable in criminal matters. But as a means to addressing a long-neglected area of legitimate social concern, time will tell whether it proves such an effective weapon as to change unsafe or unhealthy occupational practices.

Licensing danger. Generally speaking we have given insufficient attention to the sanctions and remedies in law reform. What

remedies work in given circumstances and why? The provision of private criminal prosecutions was the subject of much debate in the NSW Parliament.[21] Should it be limited to requiring the consent of the Minister or would this impose the dull hand of bureaucracy on worker self-protection? Should on-the-spot fines be permitted or could they become an instrument of bureaucratic oppression?[22] I have seen a suggestion in the Western Australian discussion paper of the introduction of licensing of work places. In its recent investigation of aspects of the insurance industry, the Australian Law Reform Commission discussed the differential utility of licensing, registration and other forms of control.[23] Generally speaking, licensing is extremely man-power intensive and often cost ineffective. It typically requires a large bureaucracy to service and police the licence arrangement and sometimes descends to little more than the issue of paper certificates. Licensing may be approriate in specially dangerous vocations such as the long-neglected area of chemical or chemical-related occupations. A legitimate debate exists about the circumstances in which licensing systems are effective elsewhere and should be introduced. We should be aware of that debate.

Regulations. I have also mentioned the debate about the scope of the new wave of legislation. In the New South Wales debate there was significant criticism about the extent to which important matters were being left to regulation.[24] In defence, the government pointed out that it was virtually impossible to incorporate specific provisions of high detail in the general statute:

> The Bill will provide the framework for a concerted and serious reform in the area of occupational health and safety. It will not be the cure-all. Some of the critics of the Bill have complained

> that it does not prescribe for every conceivable situation. I regard that as a virtue of the Bill. It will provide the mechanism by which a concerted effort could be made. It would be impossible to incorporate into an Act of Parliament all of the prescriptions that hopefully will be made by regulation. If that were attempted it would mean that it would be many years, perhaps decades, before a comprehensive Bill would be introduced. The Bill will enable the making of regulations in respect of the work environment, every hazardous occupation and every dangerous substance or chemical. It will appy to all employees in New South Wales, not just the one-third of employees who are presently covered by legislation of this kind.[25]

Statistics and Research. In hard times, the first victim of economics is often the researcher and the statistician. Their work may be seen as a luxury that cannot be afforded as money goes on other things --- such as, here, more inspectors, more industrial magistrates, more government safety officers etc. Of course, the other expenditures are worthy. But it is important for us to look to the long-term and to realise the importance of proper design of social policy. This can only be done effectively with the aid of better understanding of the dimension and nature of the problem of occupational health and safety.[26] Everyone concedes that the present state of our health and safety statistics in Australia is lamentable. Higher priority should be given to this subject, not least to monitoring the operation of new legislation. It should not be naively assumed that the new legislation will be effective, simply because it is enacted by Parliament.

The Federal role. Finally, I address the Federal role. I referred to this in a paper I delivered in November 1982 at the First National Conference on Industrial Safety held in Sydney.[27] In my paper I called attention to the national approach taken by interactive Federal and State legislation in the United States. I drew attention to the importance of the initiatives of Federal funding in the United States. I discussed the constitutional problems that stood in the way of the enactment of a single Federal Act in Australia dealing with occupational health and safety in this country.

Since that address, there have been a number of relevant developments:

* First, the statement of accord by the Australian Labor Party and the Australian Council of Trade Unions regarding economic policy was signed in February 1983. It deals in detail with occupational health and safety. It lists a number of specific initiatives, some of which have already been followed, as a means of involving employers and unions in the establishment of health and safety standards at the national level.[28]
* Secondly, in March 1983, the change of government brought to the Federal Treasury benches the Hawke Labor Government. So far, that government has pursued the approach of establishing committees and other authorities, Federal in character but with direct State involvement, to introduce the pressure for reform at a national level. Clearly, some of these initiatives provide an organisational framework within which more attention might be given to a national approach.
* Finally, it is apt to mention the decision of the High Court of Australia in the Tasmanian Dams case. That decision was handed down by the Court on 1 July 1983.[29] It is important in a number of respects for occupational health and safety. First, it makes clearer the power of the Federal Parliament to enact laws with respect to trading corporations. By such power, the Commonwealth Parliament could certainly already enact occupational health and safety legislation encompassing protection for the overwhelming majority of Australian workers. Secondly, the Court, by a majority, clarified the 'external affairs power', including the authority of the Federal Parliament to enact laws based on international instruments such as the Occupational Safety and Health Convention 1981 of the International Labour Organisation (No 155). I do not say that Federal legislation is necessary or would be more efficacious than State legislation. But the Australian community and its economy has a legitimate interest in the safety and health of workers everywhere throughout the continent, in all States. I have no doubt that the scope of the Commonwealth's legitimate constitutional power will be, and should be, examined before too long, if this is not already happening.

CONCLUSIONS

Once again, I have strayed beyond my time. I have cautioned you against excessive faith in laws. I have suggested that higher on the priority lists may be work face initiatives. Yet laws may

encourage, facilitate and promote these initiatives. I have catalogued what I see to be the matters outside debate, as the wave of legislative reform reaches the various jurisdictions of Australia. Finally, I have proposed a checklist of controversies that should have the attention of those designing the new legislation. That task is a worthy one. Ultimately, we all meet here to address very human concerns : the prevention of death, the reduction of pain, the relief from disease, the avoidance of injury and the restoration of, and compensation and redress to those who unavoidably suffer.

FOOTNOTES

* The views expressed are personal views. The Australian Law Reform Commission does not have a current reference on occupational health and safety.

1. P Taylor, Ergonomics, The Role of Ergonomics and VDUs, in IFAP Bulletin, February-April 1983, 6,7
2. 'Safety at Kwinana' in IFAP Bulletin, August-October 1983, 4.
3. ibid, 5.
4. Industrial Foundation for Accident Prevention (IFAP) Descriptive brochure, 6.
5. B T Burke, Address at Opening of Industrial Safety Week, in IFAP Bulletin, February-April 1983, 15,16.
6. This point is made by Mr R B Rowland Smith in the NSW Parlimentary Debates (Leg Council), 29 March 1983,5178,5181
7. Mr.Neilly MP, in NSW Parliamentary Debates (Leg Assembly), 16 March 1983, 4672, 4674.
8. F Marks and J Churchill, 'Understanding the Occupational Health and Safety Act, 1983 (NSW), CCH, 1983, xi.
9. IFAP Bulletin, August-October 1983, 12.
10. Mr Garland is referred to by Mr Petersen MP in NSW Parliamentary Debates (Leg Assembly), 22 March 1983, 4862 4868.

11. Occupational Health and Safety Act 1983 (NSW), s.23.
12. J Gobbo 'Law in a Multicultural Society', Address to the Second Biennial Meeting, Australian Institute of Multicultural Affairs, 17 October 1983,mimeo, noted (1984) Reform 30.
13. Mr P D Hills MP (Ministry for Industrial Relations and Minister for Technology) in NSW Parliamentary Debates (Leg Assembly), 1 December 1982, 3683, 3687.
14. This point was discussed by Mr K Ryan MP in NSW Parlimentary Debates (Leg Assembly), 16 March 1983, 4682, 4684.
15. R Madgwick, quoted by Mr Petersen, ibid, 4868-9.
16. See eg Mr Petersen, 4862, 4868; Mr Rogan MP, NSW Parliamentary Debates (Leg Assembly), 16 March 1983, 4689, 4693; Ms E Kirkby, NSW Parliamentary Debates (Leg Council), 29 March 1983, 5201, 5202.
17. Occupational Health and Safety Act, 1983 (NSW) s,5.
18. Marks and Churchill, x.
19. ibid.
20. P S M Philips, NSW Parliamentary Debates (Leg Council), 29 March 1983, 5185, 5191.
21. See eg Mr Petersen, op cit.
22. Mr. Armstrong MP, NSW Parliamentary Debates (Leg Assembly) 16 March 1983, 4663, 4664.
23. Australian Law Reform Commission, Insurance Agents and Brokers (ALRC 16), 7 ff.
24. ibid, Child Welfare (ALRC 18, para 419 ff); ibid, Privacy (ALRC 22), Vol 2, 20 ff.
25. Mr Armstrong MP, 4666; Mr Philips, 5185.
25. Mr MR Egan MP, NSW Parliamentary Debates (Leg Assembly), 16 March 1983, 4680.
26. Cf Mr Walsh MP, NSW Parliamentary Debates (Leg Assembly) 16 March 1983, 4666, 4668.

27. M D Kirby, 'Industrial Safety and Law Reform, Paper for the First National Conference on Industrial Safety, 16 November 1982 (74/82), mimeo.

28. Australian Labor Party and Australian Council of Trade Unions, "The Statement of Accord Regarding Economic Policy.' February 1983.

29. The Commonwealth v Tasmania (1983) 57 ALJR 450.

The Legislative Position on Occupational Health and Safety as it Relates to the Use of Video Display Units

(1) Legislative Protection for VDU Operators

There is no Federal or State legislation specifically relating to workers using video display units (VDUs). The protection afforded to operators is found in the general legislative provisions concerning occupational health and safety. So for example in the New South Wales, Occupational Health and Safety Act 1983 general duties of care for health and safety are owed by manufacturers, employees and the self-employed to all persons at any workplace. Section 4(1) defines a workplace as: "premises where persons work".

Section 15(1) requires that "every employer shall ensure the health and safety at work of all his employees". The comparable Victorian legislation, the Industrial Safety, Health and Welfare Act 1981 (S.11(1)) requires employers to "ensure so far as is reasonably practicable, the health safety and welfare" at work of their employees.

Without prejudicing the generality of the duty established in S.15(1) of the Occupational Health and Safety Act, 1983 (NSW), the employer's obligation is particularised in S.15(2) where the employer is obliged:

"(a) to provide or maintain plant and systems of work that are safe and without risks to health;

(b) to make arrangements for ensuring safety and absence of risks to health in connection to the use, handling, storage or transport of plant and substances;

(c) to provide such information, instruction, training and supervision as may be necessary to ensure the health and safety at work of his employees;

(d) as regards any place of work under the employer's control -

(i) to maintain it in a condition that is safe and without risks to health; or

(ii) to provide or maintain a working environment for his employees that is safe and without risks to health and adequate as regards facilities for their welfare at work."

These provisions would apply to VDU operators.

More specifically individual awards may include provisions relating to VDU operators.

(2) Compensation

No Federal or State compensation legislation specifically relates to VDU operators. Compensation provisions are found in the general compensation legislation.

(a) Commonwealth Government Employees

The Compensation (Commonwealth Government Employees) Act 1971-73 makes provision for compensation to be paid to an employee of the Commonwealth where personal injury arises out of or in the course of his/her employment. "Injury" is defined to mean any physical or mental injury and to include aggravation, acceleration or recurrence of any physical or mental injury, but does not include a disease unless the employment by the Commonwealth was a contributing factor to the contraction or aggravation of the disease.

(b) New South Wales

NSW legislation provides for compensation for workers who receive injuries, whether at or away from his/her place of employment. "Injury" means personal injury arising out of, or in the course of employment, and includes a disease which is contracted by a worker in the course of his/her employment and to which the employment was a contributing factor.

(c) Victoria

The definition of "injury" in Victoria is similar to that in the Commonwealth and NSW Acts.

These provisions would apply to VDU operators.

The following material is an excerpt from

" Damages for the Industrial Injury of Tenosynovitis " ,
Frank STEVENS and Robert DAWSON,

which is available from Work Health Co,
PO Box 430, Milson's Point, NSW 2601.
Phone - (02) 922-3255. Cost - $40 for the study, $28 for the 1984 Supplement.

COMMON LAW DAMAGES IN NEGLIGENCE

In *Uehlin v. STC Pty. Ltd.* (1) Sugerman J. in the Full Court of the New South Wales Supreme Court acknowledged the legitimacy of bringing an action to recover damages for negligence against an employer when an employee suffers from work induced tenosynovitis causing actionable damage. There have been very few cases since, dealing with common law damages for tenosynovitis.(2) It must, therefore, be borne in mind that the cases that come before the courts in the near future will be formative of this area of the law of negligence. The courts must be wary lest they create insuperable hurdles for deserving litigants.

Stated concisely, an employer has a duty to take reasonable care for the safety of his employees. The scope and qualifications of this duty are manifold. In *Hamilton v. Nuroof (WA) Pty. Ltd.* (3) Dixon CJ and Kitto J said,

> "[I]t is a duty to take reasonable care to avoid exposing the employees to unnecessary risks of injury. The degree of care and foresight required from an employer must naturally vary with the circumstances of each case."(4)

The authors of the text *The Liability of Employers* (5) submit that,

> ".... no rules of law as to the standard of care called for in particular situations have achieved recognition and the possibility that they ever can has been decisively rejected."(6)

This approach allows the courts scope to do justice on the facts present in industrial tenosynovitis cases.

The standard of care therefore is decided on the facts.(7) The degree of danger in terms of both the severity of the condition and the chances of contracting it is considered with commercial factors. Given that the courts allow themselves this flexibility, plaintiffs must firmly establish their entitlement to justice backed up by appropriate medical engineering and possibly ergonomic evidence. This is what was suggested by Sugerman J. for the court in *Uehlin v. STC Pty. Ltd.*(1)

The employers duty is subdivided into at least three heads.(8) Those relevant for present purposes are first, to provide and maintain adequate plant and appliances and secondly to provide a safe system of work. The subdivision of heads is made for the convenience of classification clarity. There is no substantive legal distinction. The duty is a general duty to take all reasonable steps to avoid risk to employees. In the recent Supreme Court judgement *Lashford v. Plessey*(9) the plaintiff, a production line worker, was instructed to assemble defective parts. This resulted in added strain precipitating carpal tunnel syndrome and tenosynovitis. That case was apparently partly based on the employer's duty to provide adequate plant and appliances and partly on the duty to *provide a safe system of work.*

Tenosynovitis can result from undue repetitive strain caused to a manual operator of a device because of its malfunction or lack of maintenance. In the unlitigated case of Mrs. B., the

plaintiff, who operated a defective hand press 2000–3000 times a day, requiring abnormal "pushing and pulling", contracted tenosynovitis in the shoulder and neck. Again, there is an apparent breach of the employer's duty to provide adequate plant and appliances.

Similarly, data processing operators who are given unsuitable seating or tables to work with could allege a breach of their employer's duty to provide adequate plant and appliances. Indeed, in *Baxter v. St. Helens Group Hospital Management Committee* [10], a chair weakened by woodworm collapsed when a nurse sat down. There was no system of inspecting furniture and the employer was found to be negligent. It follows, then, that when an employee sits continually in a faulty chair for the entire working day every day, thus after a period of time sustaining an injury, the employer would be similarly liable. An employer of data processing operators or seated process workers then bears a strong duty to provide properly designed and maintained seating so as to minimise the occurrence of tenosynovitis or other overuse diseases.

Many employers liability cases have been decided upon the duty to provide a safe system of work. It may be shown that a given series of operations results in certain quantifiable arm movements and there is statistical and medical probability that a proportion of employees so engaged will contract tenosynovitis. The cases indicate, however, a requirement for courts to balance the commercial needs of the employer against the health needs of the employees. While the employer is said to be obliged to provide a safe system of work he is not liable to tenosynovitis victims unless it can be shown that he failed "to take any steps which were reasonably available in order to eliminate the risk or to reduce it as far as possible."[11] This test, however, must be matched against the prospect of the courts not tolerating grossly dangerous systems of work where such steps are not reasonably available.

Where tools or working positions are defective or the system of work defective, to the extent that an operator suffers compensable damage from tenosynovitis the employer is not, per se, thereby liable. He is liable only if, considering all the circumstances, he has failed to take reasonable care for the safety of the employee. This encompasses four issues to which a plaintiff must adduce evidence in order to prove his case. To borrow from *Glass, McHugh and Douglas*, [12], they are:

(a) The foreseeability issue
(b) The preventability issue
(c) The causation issue
(d) The issue of reasonableness.

The fourth issue is not one requiring evidence of its own but is a judgement to be made based on the evidence appertaining to the first three issues. It is the issue that is left to a jury if on the evidence the judge is satisfied that the other three issues have as a question of law been, on the evidence, established on a balance of probabilities.

Foreseeability

To succeed a plaintiff must show that it was reasonably foreseeable that, for example, the seating and table position or the hand operated press were such that they gave rise to a risk of injury, specifically tenosynovitis. One of the necessary elements in negligence cases is foreseeability. Is it reasonably foreseeable to an employer that a given employee will get actionable tenosynovitis? The meaning of foreseeability is explained in *The Council of the Shire of Wyong v. Shirt* [1] by the High Court. Mason J. said,

> ".... the foreseeability of the risk of injury and the likelihood of that risk occurring are two different things ... A risk of injury which is quite unlikely to occur ... may nevertheless be plainly foreseeable. Consequently when we speak of a risk of injury as being 'foreseeable' we are not making any statement as to the probability or improbability of its occurrence, save that we are implicitly asserting that the risk is not one that is far fetched or fanciful ... A risk of injury which is remote in the sense that it is extremely unlikely to occur may nevertheless constitute a foreseeable risk."[2]

An employer in the light of medical information, newspaper publicity as well as his own experience, can be expected to know of the risk of tenosynovitis to workers who do repetitive work. If that risk is small it nevertheless may be foreseeable.

Most tenosynovitis cases would present little difficulty in satisfying the foreseeability issue. In *Uehlin's case* [3] Sugerman J. said in 1963,

> "It is clear that the risk of tenosynovitis was inherent in the employment as indeed it is inherent in other production line employments, and for that matter, in other activities involving quick repetitive movements; although by no means everybody who engages in these employments or activities contracts the disease."[4]

His Honour did not appear to consider significant the fact that not everybody who engages in these employments or activities contracts the disease. Foreseeability was nonetheless established. *A fortiori* in 1982, it is submitted that if such an employer did not know of the risk he ought to have known of it.

This is perfectly consistent with His Honour's judgement in the later Court of Appeal case of *Chomentowski v. Red Garter Restaurant Pty. Ltd.* [5]. In that case a servant was violently assaulted while depositing the takings of the Coachman Restaurant in the early hours of the morning at a Surry Hills bank. His instructions were to deposit the takings after the close of business each evening on his way home. The plaintiff and his predecessor had performed this duty regularly nearly 600 times without incident. The employer had no way of knowing if and if so when such an injury would occur. The court regarded the risk as substantial and with sufficient foreseeability. The analogy to be drawn is that even though it cannot be foreseen in

permanent disability from tenosynovitis cases if and when the damage will occur, that does not prevent it being foreseen.[7]

Given that the duty owed by the employer is to each individual employee, it does not matter that individuals vary in their susceptibility to tenosynovitis. In *Paris v. Stepney Borough Council* [8], the House of Lords placed an added burden on an employer to make sure that a one-eyed employee had his good eye protected by safety goggles. The burden would have been less if the worker had two good eyes.

If a production line worker in the course of doing his or her work has the need to repeatedly move hands and arms in a flourish of activity, then that person may have greater susceptibility than workmates. Similarly a more experienced operator who works at a greater speed and has had longer exposure to the particular work will be at a greater risk of contracting tenosynovitis. These matters must be allowed for by the employer. He is bound to take the degree of care that will reasonably safeguard each employee.[9]

An employer is not obliged to have foreseen who is at greatest risk. In a group of workers there will be a spread of individual susceptibility to tenosynovitis. The level of susceptibility then is one of an infinite range of human characteristics that go to make individuals. A person having higher than average susceptibility will not be regarded as having a hidden weakness that the employer is not aware of thereby absolving the employer. An analogy can be drawn by reference to individuals' varying abilities to anticipate dangerous situations and avoid them, and those who are not as perspicacious or fleet footed. The employer must take the degree of care as will reasonably safeguard each individual employee. If this means foreseeing the risk of tenosynovitis in terms of the susceptibility of those of greatest susceptibility then so it must be. In *Chomentowski v. Red Garter Restaurant Pty. Ltd.*[10] Sugerman J. said,

> "Immunity in the past would hold out no promise of immunity from or reduction of risk in the future, any more than the fact that one has not had a viral infection for many winters gives promise that, on that account alone, one will not suffer one, or is less likely to suffer one, next winter."[11]

Foreseeability presents factual difficulties for plaintiffs alleging unsafe plant and appliances. These difficulties are by no means insuperable. The hand press operated by Mrs. B mentioned above took a "lot of pushing and pulling" to use it. Presumably this was due to a malfunction of the press itself. To secure their rights, employees in this situation should ideally report the malfunction to the employer. It could then be inferred by a jury that a reasonable employer would have foreseen the risk to the employee of suffering an overuse injury. Failing that, the employee will have to establish that the employer had a duty to inspect the press at regular intervals.[12] If the operator is not a skilled person then it is submitted that it would be reasonable in the circumstances that the employer be bound to inspect appliances in order that they be maintained in a proper condition without the employee having to initiate the action.

The plaintiff cannot establish foreseeability if the fault in the machine is not discoverable upon inspection unless it can be argued that the disease is attributable to its useage in good working order and there was an unsafe system of work. In another scenario it could be that a part, such as a return spring, on the machine was missing thus necessitating pulling as well as

pushing. When in good working order the press, it could be hypothesised, did not require pulling because the mechanism returned to the quiescent state under spring tension. The employer upon examining or being informed of the condition of the press ought to have foreseen a risk of some overuse disease such as tenosynovitis.

The position of data processing operators suffering from industrial tenosynovitis can be similarly considered. The statistics quoted in Appendix C give some indication of the risk that these employees undergo. The figures have been compiled by employee organisations and placed before managements. In at least one area, industrial action was in train at the time of writing to encourage management to adopt an improved method of work and/or improved equipment in the form of seats and tables, to reduce the risk of employees of suffering from tenosynovitis. As a result of this and the present high level of public awareness fostered by the mass media, employer defendents who operate in these high risk areas can be reasonably said to know or ought to know of the risk of tenosynovitis to their employees.

Technology has produced devices that are claimed to determine a workers' or prospective workers' susceptibility to tenosynovitis. Assuming that they are accurate their availability may be regarded by the Courts as making more difficult any employers denial of foreseeability. Such a device will enable an employer to foresee the relative likelihood of an employee getting tenosynovitis. These devices and their legal implications are discussed below under the heading "Tenosynovitis Testing Devices".

The salutory words of Windeyer J. in the High Court in *Da Costa v. Cockburn Salvage & Trading Pty. Ltd.*[13] should be quoted as a guide to legal objectivity:

> "It is always important to remember that the fact that an accident happens to a man at work is not of itself evidence that those in control of the work or responsible for the manner of its performance were negligent. If a man be unreasonably exposed to the risk of injury that fact must ordinarily be apparent before he was injured. An intelligent, instructed and reasonable observer must then have foreseen the possibility of an accident. It must have been clear then that the employer was failing in his duty to take reasonable care for the workman's safety."[14]

Prevention by a reasonable alternative

If the plaintiff does not or is unable to show that a reasonable alternative exists to enable the employer to arrange the system of work or the safety of plant in such a way as to eliminate or greatly reduce the tenosynovitis risk, then the plaintiff's onus of proof is not discharged and his case will fail. An illustrative case is *Neill v. N.S.W. Fresh Food and Ice Pty. Ltd.*[1] where a worker, cleaning the inside of a stainless steel milk tank, slipped, fell and was injured. Although the risk of such an occurrence was foreseeable, his case failed because no evidence was led to show that, for example, a handrail could have been installed in the tank which did not create other hazards for the worker or compromise hygiene requirements.

In *Uehlin v. STD* [2] the plaintiff failed because she did not link, by appropriate evidence, the causation of her illness with the submitted reasonable alternative. It was argued on her behalf that the chair provided for her was too low and, unlike the chairs provided to other employees, was not adjustable. The alternative submitted was obvious – she should have been given a properly adjusted adjustable chair. However, the medical evidence led associated causation, not with chair height, but with repetitive hand movements.

Additionally, Sugerman J. said that, although the plaintiff may well have been required to work too fast,

> "..... the rate of speed in fact set by the team of workers in order to take advantage of the incentive system is not in any event shown by the evidence to have had any causal connection with the contracting of tenosynovitis in the sense that a lower speed would have removed or reduced the risk."[3]

Remarkably, His Honour then said,

> "And, if the fact is that there was such a connection, it is not shown by the evidence to have been apparent to anyone concerned."[3]

It is respectfully submitted that this statement is open to criticism. There is no authority for the use of a subjective test as to what was apparent to those concerned. The correct test is the objective test of the reasonable employer finding himself in the same circumstances.

Consequently there are two ways to get around the difficulty presented by *Uehlin's case*.[2] The first is to take the advice of Sugerman J and painstakingly lead evidence to establish a clear link between causation and preventability. The second is to argue that *Uehlin's case* [2] was wrongly decided. The writers suggest that being the first case in which these issues were argued, counsel for the plaintiff had only general guidelines at their disposal as to the evidence required as determined by decided employers liability cases. In *Uehlin's case* [2] the published report is completely devoid of references to decided cases in relation to matters presently relevant. The inference drawn is that *Uehlin's case* [2] was not well argued and principles from decided cases were not put before the court nor does it seem they were used as general guidelines to determine the evidence to lead.[4]

There is ample information available to employers about ways and means of greatly reducing the incidence of tenosynovitis. This information arms a plaintiff employee with evidence to discharge his onus to contrast an alternative economically reasonable and practical work method.[5] For example, data processing operators can have imposed a key stroke limit of say 10,000 characters per hour; incentive systems can be discontinued; desk and chair heights can be adjusted for optimum safety for each individual; workers can be given short relaxation periods; jobs can be rotated; individuals can be coached in order to avoid unnecessary movements; occupational health or ergonomic advice can be obtained to assist in properly designing activities such that those movements which are more conducive to tenosynovitis are reduced and those less so are utilized. These measures produce favourable results.[6] If an employer was to adopt any of these measures without significant success his interests are nevertheless served because it increases the difficulty for a plaintiff employee to establish that there was a reasonably practical alternative.

This is a straightforward problem of fact for a plaintiff. Medical engineering and ergonomic opinion should be evidenced and/or the opinion of someone with the experience of the industrial and social aspects of the disease.

Causation

One of the difficulties anticipated is where a tenosynovitis sufferer has engaged in activities outside work that could, along with employment activities, cause tenosynovitis. This is a problem with workers who have home duties to attend to before and after work. *Glass, McHugh and Douglas* in their text say,

> "The most satisfactory formulation of the legal concept of causality confirms that conduct is causally relevant if it is necessary to complete a set of conditions jointly sufficient for the production of the consequences."(1)

To put this in context, there is a causal connection between the disease of tenosynovitis and an *unsafe system of work or unsafe equipment* if the disease would not have occurred but for the unsafe system of work or unsafe equipment.

It is not necessary to be able to specify the exact chain of events that caused the disease. A plaintiff satisfies his onus of establishing causation if he can show on a balance of probabilities that the disease arose out of a specific defective system of work or specific defective equipment.(2) Nor is it necessary for the actionable facts to constitute the only cause of the disease. An illustrative case is *Power v. Snowy Mountains Hydro Electric Authority.*(3) A worker entered into employment already suffering from silicosis having previously worked in various quarry drilling operations. Nevertheless his health at this stage was good. His condition was aggravated and deteriorated when being employed to work in very dusty conditions made so partly by the employer's failure to provide water for the drills.

The dust present in the air was not due solely to the lack of water in drilling. Other operations such as rock crushing contributed. The New South Wales Court of Appeal said,

> "The task of the plaintiff was to provide evidence from which, prima facie, it appeared to be more probable than not that the dust from the drilling materially contributed to his injury."(4)

The parallel with industrial tenosynovitis cases is clear. If the other requirements to establish negligence are satisfied then a tenosynovitis sufferer need only show that the work in question materially contributed to the injury, to succeed.

The wide scope afforded by the issue of causation is qualified by the concept of remoteness. The test of remoteness is based on foreseeability. Foreseeability is discussed above as the basis of establishing liability but foreseeability in relation to causation is a slightly different concept.

If a worker contracts tenosynovitis in circumstances where the employer adopted an unsafe system of work and/or supplied unsafe equipment and the reasonable employer would not have foreseen that the worker might contract an overuse disease then the damage is too remote from the cause and the employer cannot be liable. Thus, foreseeability is a dual purpose test in tort. As Windeyer J. put it in *Mt. Isa Mines Ltd. v. Pusey,*(5)

> "So now we have the blessed, and sometimes overworked, word 'foreseeability as a single test for both the existence of liability in negligence and the extent of recoverable damage."(6)

Remoteness is the linguistic inverse of "extent of recoverable damage' which is an abbreviated expression for "the extent of the harm for which damages may be recovered for breach of the employer's duty". The case of *Mount Isa Mines Ltd. v. Pusey* (5), places an important qualification to this. Tenosynovitis is a type of disease belonging to the genus of overuse diseases. The above case is authority for the proposition that the reasonable employer need only have foreseen that the worker might contract some overuse disease thus easing the burden of proof on the plaintiff. Describing it as a "comfortable latitudinarian doctrine" Windeyer J. in the High Court said,

> "The particular pathological condition which the shock produced need not have been foreseeable. It is enough that it is a recognisable psychiatric illness."(7)

In that case the plaintiff suffered a rare and therefore not specifically foreseeable mental disease but it was held that some sort of psychiatric illness was reasonably foreseeable and this sufficed on the facts of that case to establish the extent of recoverable damage.

The foreseeability test is qualified by the principle that a tortfeasor must take his victim *as he finds him. The type of cases in point are known as the "egg shell skull cases". In Smith v. Leech Brain & Co. Ltd.*(8) a worker was burned by a splash of molten metal. This was seen by the court as foreseeable. Yet it was not foreseeable that because of the worker's predisposition to cancer he developed a carcinoma from which he died. The court held the damage not to be too remote. The type of injury only, need be foreseeable not the extent of the consequences of the injury.

In industrial tenosynovitis cases therefore, an injury is not too remote where an employee has a particular susceptibility to the disease or a susceptibility resulting in a more serious disease developing such as capsulitis.

These points are exceptions to the foreseeability rule as laid down in the High Court in *Council of the Shire of Wyong v. Shirt* (9) discussed above.

Lord Morton in *Paris v. Stepney Borough Council* (10) said,

> "In considering generally the precautions which an employer ought to take for the protection of his workmen it must in my view, be right to take into account both elements, the likelihood of an accident or disease happening and the gravity of consequences."(11)

The gravity of the consequences in tenosynovitis cases will vary from person to person. Given that the duty owed by the employer is a personal duty to each employee then if the more drastic consequences of permanent disablement or disfigurement occur then the degree of care exacted by the law from the employer is commensurately high. Gravity of consequences is an element of the general proposition that a plaintiff must establish on reasonable grounds that he is more entitled to justice than the defendant. It may be more difficult to convince a jury of this if there is not visible disfigurement or palpable disablement. In other words, a jury may under-rate the

gravity of the consequences and adjust its requirement for a duty of care downwards thus rendering the chances of a deserving plaintiff, who nevertheless suffers and will continue to suffer great pain and restricted employment opportunities as a result of tenosynovitis, much reduced. Expert medical evidence may assist but a doubt could conceivably be planted in the minds of the jurors about the credibility of the plaintiff's case.

Reasonableness

The common law is moving away from the simplistic notion espoused by Lord Dunedin in *Moreton v. Dixon (William) Ltd.*[1] that there were only two kinds of "fault and omission" on the part of employers. He said they were,

> "..... that the thing which he did not do was a thing commonly done by other persons in like circumstances or to show that it was a thing which was so obviously *wanted that it would be folly in anyone to neglect to provide it.*"[2]

Such a statement of the law may induce employers to rely on the status quo of the industry in reliance on the notion that he should do no more to *reduce the incidence of tenosynovitis* in his workforce than any other employer in like circumstances.

Where courts have seen the desirability to do so they have got around this requirement. The High Court of Australia in *Hamilton v. Nuroof (W.A.)*[3] per Dixon C.J. and Kitto J. criticised the above quoted use of the word "folly" by Lord Dunedin as being devoid of meaning. They said the proper consideration was "a failure in reasonable care for the safety of the workman".

In the House of Lords in a 1953 case, *General Cleaning Contractors Ltd. v. Christmas* [4] a window cleaner was required to stand on a narrow window sill and hold on to the timber window sashes high above the ground. This had long been the practice of window cleaners to clean ordinary double sash windows. Lord Reid said,

> "A plaintiff who seeks to have condemned as unsafe a system of work which has been generally used for a long time in an important trade undertakes a *heavy onus: if he is right it means* that all, or practically all the numerous employers in the trade have been habitually neglecting their duty to their men."[5]

He went on to hold for the plaintiff. *The employee litigant must show* that the system or equipment provided was unsafe and further show alternatives that could reasonably have been adopted to reduce the incidence of tenosynovitis. *This will suffice* to get around *an argument based on* the long established practice in the trade. It is an open question whether or not, in the words of Lord Reid, "numerous employers" in the data processing or process work "trade" have been "habitually neglecting their duty to their workers". It certainly appears to be arguable.

Reasonableness is a matter for the jury. The cases give guidelines for juries that they may be able to judge the merits of each party's evidence and come to a conclusion on the facts. A judge will not put a case to the jury unless he is satisfied that the legal requirements of foreseeability, preventability and causation have been met by the evidence presented on behalf of the plaintiff who bears the onus of proving his case on a balance of probabilities.

APPENDIX 2

NATIONAL OCCUPATIONAL HEALTH
AND SAFETY SECRETARIAT

National Occupational Health and Safety Secretariat

M J Talberg
Secretary
Joint Parliamentary Committee
of Public Accounts
Parliament House
CANBERRA ACT 2600

HEALTH AND SAFETY FACTORS RELATING TO THE USERS OF SCREEN BASED EQUIPMENT

Your memorandum of 23 July 1984 addressed to the Assistant Secretary, Working Environment Branch of the Department of Employment and Industrial Relations has been passed to me. Departmental responsibilities for the Physical Working Environment has, since 1 July 1984, been reallocated from the Working Environment Branch to this Secretariat.

You asked for advice on who is exercising responsibility in occupational health and the role of the Department of Employment and Industrial Relations in this field. The Interim National Occupational Health and Safety Commission (INOHSC) has reported to the Minister for Employment and Industrial Relations. The Report was tabled in the House of Representatives on 29 May 1984. The Government is considering its recommendations and we expect that there will be positive announcements made in the next couple of weeks about the proposed National Commission.

Meanwhile a National Secretariat has been established which brings together the INOHSC Secretariat and the Physical Working Environment section of the Department. This is a preliminary move in view of the INOHSC recommendations which provide that the Minister for Employment and Industrial Relations will have sole responsibility for all occupational health and safety matters. If the recommendations are accepted these areas in other Departments and Authorities will then be transferred to join this basic group.

Late in May a Committee on Occupational Health and Safety in Australian Government Employment (COHSAGE) was established on a joint management-union basis. It is envisaged that COHSAGE will become a Standing Committee of the proposed National Commission. Meanwhile it is the advisory body in Australian Government employment. I am now Chairman of COHSAGE.

Your other question related to the availability of statistics associated with screen based equipment and the number of compensation claims which are SBE-related. We do not have detailed information but we understand that the Public Service

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Board has collected information in recent times. Some of the Statutory Authorities eg Telecom, would also have detailed statistics.

When the Government has made a firm decision about the future of occupational health and safety I will ensure that you are given details of the new arrangements.

J T C BRASSIL
Head of Secretariat

25 July 1984

APPENDIX 3

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL GUIDELINES

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL

occupational health guide ..... VISUAL DISPLAY UNITS

Adopted at the Ninety-third Session of Council, June 1982 and amended by the Ninety-sixth Session (October 1983)

COMMONWEALTH DEPARTMENT OF HEALTH

introduction .. 1. This guide is concerned with the possible effect on health of the use of equipment incorporating an illuminated display as an integral part of its configuration. Such equipment includes visual display units and terminals, video display units and terminals, screen-based word and data processing equipment and micrographics equipment (VDUs). The type and amount of interaction with the display determines health effects such as those described in this guide.

equipment ..... 2. The design and layout of the equipment should meet ergonomic requirements (see FIGURE 1).

- The VDU screen should be located so that the centre of the display is 15 plus or minus 5 degrees below the level of the operator's eyes;
- separate devices to adjust the height of the desk and keyboard, the position of the source documents and the height of the terminal display are desirable. The chair should be easily adjusted and freely movable;

- the preferred work posture is illustrated in Figure 2.

- the seating position should ensure that:

  .. the feet can be placed flat on the floor or other support with the thighs horizontal;

  .. weight is taken on the buttocks and upper part of the thighs only;

  .. the movement of the legs is not restricted;

  .. there is no pressure at the back of the knees;

  .. the body can be held comfortably erect with the back supported in the lumbar region;

  .. the relative heights of the seat and the working surface should be so adjusted that the shoulders are relaxed when the hands are resting on the keyboard. The arms should hang naturally with the angle between the forearm and upper arm at or slightly greater than 90 degrees, so that there is a minimum of wrist bending;

- the working surface should be large enough to allow the equipment to be moved as required by the operator and to provide room to rest the forearms and hands. It should be of a neutral colour and have a matt finish to minimise reflections;

- the work area should be such that the operator can use the VDU with freedom of movement of the legs and arms and have room enough for all source and reference documents;

- the keyboard should be detachable from the screen so that operators can move it to the most comfortable position for posture and viewing distance from the screen; e.g. for one handed keying tasks, the keyboard should be placed to one side of the operator, favouring the hand being used. The keyboard should be as thin as possible. (30 mm is recommended);

- keys, keyboard, document holder and documents should have a matt finish;

- the screen, document holder, and reference cards should be placed about the same distance from the operator to avoid unnecessary changes in eye accommodation (Figure 1);

- the desk top should be as thin as possible, preferably no more than 25 mm;

- the location of the VDU must be such that the screens and bench surfaces are not affected by reflection and glare and/or excessive light from windows or overhead luminaires. Reflection and glare can be reduced by shields or screen coating;

- the visual task should be the brightest object in the visual field and the brightness of the surroundings should be graded off as gradually as possible;

- many screens generate considerable heat; therefore the office temperature should be maintained at a comfortable level;

visual factors affecting performance ...

3. Visual factors affecting the performance of an operator include the distance between the operator and the observed object and the dimensions and brightness of the elements comprising the visual task. The combination of the task elements and the visual acuity of the operator determine the best operating distance.

4. For efficient visual performance, the operator requires:

- optimum size and spacing of critical detail;
- contrasting tone and/or colour between the observed object and its immediate background;
- the observed object remaining stationary. The refreshing rate of the screen should be over 50 cycles/sec. to produce a flicker-free display;
- adequate illumination. The appropriate level of illumination of the benchtop and working area is 350-500 lux;
- the luminance ratio between the task area and the general surroundings not greater than 4:1;
- avoidance of excessive contrast between the immediate visual field and the surroundings;

- adequate ceiling mounted local lighting where source documents are used in conjunction with a VDU. A desk lamp at eye level causes unwanted reflection and glare and should not be used;
- a clear view away from the screen to relax the muscles responsible for accommodation;
- care to avoid the introduction of high reflectance materials such as white boards, glass partitions, glass desk tops, highly polished floors and other such surfaces into a VDU area.

visual fatigue ..

5. There is no scientifically acceptable evidence that the use of VDU's damages the eyes or eyesight or imposes any risk from radiation.

Continual use of VDUs has led to complaints of visual fatigue and apprehension concerning damage to eyes or vision (see Appendix 1)

A worker engaged in a visual task may suffer visual fatigue because of:

- small size of visual object requiring maximal effort;
- poor contrast at the work point;
- light which illuminates the eye more than the light emitted or reflected from the observed object (glare);
- low level of illumination, or uneven distribution of light;
- flickering or other uncontrolled movement of the visual target;

- poor legibility (e.g. as in bad handwriting) and poor definition in the source document (e.g. as in some carbon copies).

Age and visual fatigue ..

6. Operators over the age of 40 to 45 years may need glasses to read VDU screens and source material comfortably and efficiently. A person's normal reading glasses may not be suitable because reading spectacles have a focal length between 300-350 mm whereas typical reading distances from screens range from 400 mm to 1 m. Special lenses may be required for occupational use. The consultant should be informed of the locations of the VDU screen and source material.

posture and visual fatigue .....

7. When the observed object is in an unsuitable position, discomfort is felt and increases progressively as the eyes are turned constantly from the mid-position. To prevent discomfort the head is turned. Though the load on the eye muscles is reduced, the sustained contraction of muscles of the head, neck and trunk is an additional cause of fatigue. Constrained posture at the workplace may also produce muscular pain and stiffness. For operators over 45 years and using biofocal lenses, the screen should be tilted about 10 degrees backward to avoid an uncomfortable work posture;

eye tests .....

8. There is no particular need for VDU operators to have eyesight tests any more often than, or differing from, those applicable to other clerical workers. However, on commencement of work with VDUs and in accord with

normal occupational health practice it is desirable for operators who work consistently with VDUs to have their vision screened to determine whether their performance may be adversely affected by any existing defect e.g. operators with visual defects such as uncorrected moderate refractive errors or presbyopia, unstable binocular vision or uncorrectable lowered visual acuity, may have difficulty with close visual work.

9. Eyesight screening tests can be conducted at the workplace by a person trained in the appropriate techniques. Under no circumstances should failure to pass a screening test be used as a criterion for non-selection without referral to an optometrist or ophthalmologist.

(See Appendix 2 for a description of appropriate tests.)

rest periods .....

10. The VDU operator should be provided with an opportunity to rest his/her eyes and change posture from time to time as required by circumstances. Normal rest periods for personal hygiene and meal breaks will be adequate for the majority of users working under conditions which meet the requirements specified in this guide.

further reading

11. Cakir, A., Hart, D.J. and Stewart, T.F.M. The VDT Manual 1979.

Appendix 1

Visual Fatigue

visual fatigue .....

Visual fatigue has two components; muscular and perceptual. Muscular visual fatigue is a consequence of undue use of the muscles which:

- rotate the eyeballs within the skull and by which the movements of both eyes are co-ordinated so that the visual axes of the two eyes meet at a common object of attention (convergence);
- alter the shape of the lens to focus the image of the object on the retina (accommodation), adjust the pupil aperture according to the brightness of the field and the need to stop down the lens for near vision.

personal causes of visual fatigue .....

Ocular conditions inherently conducive to excess compensatory effort by the eye muscles, such as long sightedness, faulty accommodation or convergence, or a structural condition of the eye which blurs the visual image (astigmatism), all aggravate the difficulties of prolonged visual tasks.

Perceptual fatigue is a mental phenomenon resulting from prolonged effort in interpreting visual data. It causes poor performance and may lead to task aversion.

APPENDIX 2

EYESIGHT SCREENING TESTS

1. Distance Visual Acuity
2. Near Visual Acuity
3. Oculomotor Co-ordination
4. Colour Vision

distance visual acuity .....

1. testing of distance visual acuity using a Snellen letter chart at a distance of 6 m from the subject.

   If the subject usually wears an optical correction it should be worn during the test. More than two errors with either eye in the 6/9 line indicates a need for referral to a consultant.

near visual acuity .....

2. testing of near visual acuity using a suitable near distance chart such as the Times Roman chart at the subject's normal working distance, usually in the range of 40 to 70 cm. If the subject normally wears an optical correction, it should be worn during the test. If the subject wears bifocals, the card should be viewed through the reading segment. Operators making more than two errors with either eye in the 6/9 line should be referred to a consultant.

oculomotor co-ordination .

3. testing of oculomotor co-ordination using a Maddox wing test or its equivalent. Normal optical correction should be worn during the test. Referral to a consultant is necessary when:

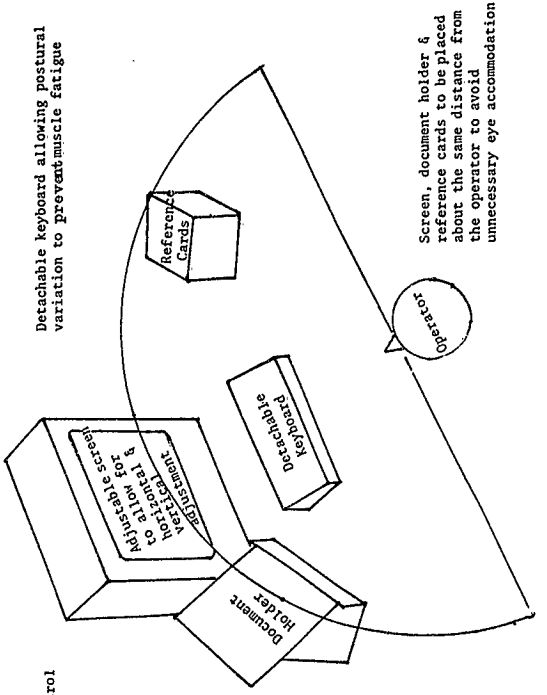
   (a) horizontal heterophoria exceeds 12 dioptres of exophoria or 5 prism dioptres of esophoria

   (b) vertical heterophoria exceeds 1.5 prism dioptres.

colour vision .....

4. colour vision may be checked by using the Ishihara colour vision test.

LAYOUT FOR SCREEN, KEYBOARD AND DOCUMENT HOLDER



SCREEN

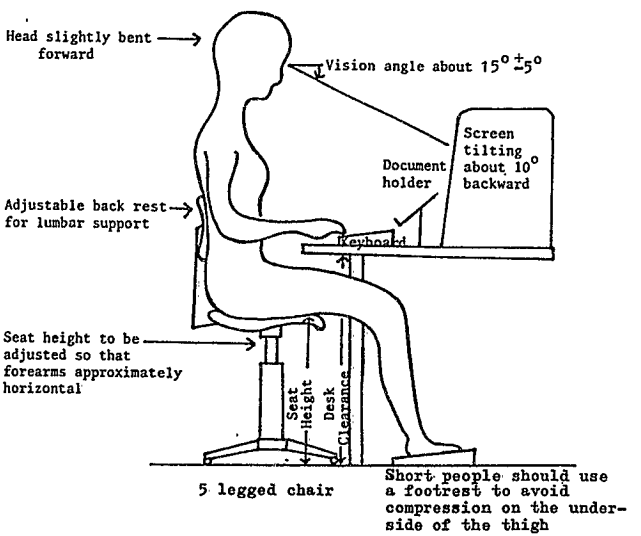
1. Adjustable light control
2. Refreshing rate ≥50 cycles/sec.

DOCUMENT HOLDER AND THE NEARBY WORK SURFACE

Surface illumination level about 400 lux and not more than 4 times the screen level

FIGURE 2

PREFERRED WORK POSTURE



The seat height should be adjustable between 385 and 475 mm. The desk height should be adjustable to provide a variable height for the working plane (i.e. the top of the home row of keys - between 640 and 760 mm).

EMPLOYERS' POLICY

OFFICE OF THE PUBLIC SERVICE BOARD
McLACHLAN OFFICES
National Circuit, Canberra, A.C.T. 2600 Telephone 72 3977

Reference: 81/418
23 October 1981

PSB Memorandum

All Departments, Statutory Authorities and Staff Organisations

Operation of Visual Display Units (VDUs) and other Screen Based Equipment (SBE)

Approaches from Departments and staff associations have indicated concern by both management and staff about possible hazards associated with the sustained operation of VDUs * and other screen-based equipment eg micrographics and word/data processing equipment. Departments will be aware of the document prepared by the Australian Public Service Association setting out its views on a number of aspects of SBE operation. The purpose of this circular is to provide information on sources of specialist advice on matters likely to affect the health and safety of operators, and to convey the Board's views on certain issues of concern to management and staff. There has been consultation with departments and staff associations on the issues with which this advice deals.

2. Technical considerations

In preparing this advice, the Board has consulted with the two Commonwealth Departments which have defined roles under the Code of General Principles, Occupational Safety and Health in Australian Government Employment **. The Department of Science and Technology *** has had a general responsibility in relation to occupational safety matters and the attention of departments is drawn particularly to Issue No 13 of the 'At Work' series which discusses lighting, layout and design etc aspects of a desirable working environment for VDU operation[1]. The Director-General of Health is the occupational health authority for the Commonwealth and has gazetted a recent National Health and Medical Research Council (N.H. & M.R.C) occupational health guide on eyesight testing for VDU operators[2] for adoption in the Australian Public Service. References to these documents and other sources of authoritative information are provided. Departments and Authorities are encouraged to consult these when formulating detailed management policies

(* The term VDU includes Visual Display Terminal (VDT) throughout this circular.)

(** Issued in 1975 by the then Minister for Labour and Immigration and subsequently endorsed by the present Government.)

(*** This responsibility is to be transferred to the Department of Industrial Relations)

governing the operation of screen based equipment. (It should be noted that at the time of preparation of this circular, the NH&MRC is preparing a more extensive occupational health guide for the Australian community on the use of screen based equipment. This is expected to be available at a later date.)

3. Policy issues associated with VDU operation

(a) Eyesight testing

The National Health and Medical Research Council Guide notes that VDU operators who spend significant periods of time in front of a screen may report symptoms of visual fatigue (or 'eyestrain') such as headaches or dizziness etc., and that these often result from uncorrected or inadequately corrected visual disorders. The guide recommends that VDU operators should have eyesight tests:

- on commencement of work with VDUs;
- at two yearly intervals after the age of 40 years;
- whenever indicated by the onset of symptoms.

In drawing attention to these recommendations the Board expresses the view that testing should be on a voluntary basis and confined, at this stage, to staff who work substantially full-time on screen-based equipment.

Whilst the arrangements for testing programs are the responsibility of Chief Officers, the Department of Health should be consulted initially to ensure that the correct procedures are followed. Testing should normally be conducted by the Department of Health; where this is not possible, private practitioners (e.g. optometrists) can be utilized after advice has been received from the Department of Health on a suitable fee, and the recommended test protocol. Tests recommended by the NH&MRC include distance and near visual acuity, oculomotor co-ordination (eg Maddox Wing test), and the Ishihara test of colour vision.

Whilst the Board acknowledges that it is reasonable to provide eyesight screening tests for employees, liability for further examination or treatment is normally the responsibility of the employee. In particular, the cost of spectacles will not be met, since available medical evidence indicates that operation of VDUs is not in itself responsible for damage of the eyes or eyesight.

(b) Rest Breaks

The issue of rest pauses is discussed widely in relation to the operation of SBE. It is inevitable that sustained concentration will produce fatigue. Sound and sensible management would suggest that where possible, screen - based tasks should be organised in such a fashion, that spells from concentrated activity at the display screen are available throughout the working day. In any event, it is desirable that supervisors should be well informed on relevant aspects of the causes and alleviation of excessive

operator fatigue. They should also be aware of the need for a sufficient break, having regard to the nature of the task and the need for involvement in substantially different activities during the break. Rest breaks will ordinarily be more acceptable to staff if they have an opportunity to participate (subject to operational requirements) in decisions about their frequency and duration.

(c) Radiation Hazard

Staff can be advised that available evidence indicates that the risk and levels of radiation leakage from a VDU are insignificant, and that there is no risk to health. According to available sources, radiation leakage is well below normal 'background' levels, so that no long-term hazard has been identified. Nor is there any evidence of increased emission in otherwise faulty equipment. Because of the lack of evidence of any hazard, the Board does not consider it necessary for equipment to be regularly monitored for radiation leakage. Staff requiring further assurance on this should be referred to the information bulletin prepared by the Australian Radiation Laboratory[4].

(d) Working Environment (See also Attachment A)

The effects on efficiency and operator well-being of proper attention to furniture and equipment design, layout, lighting and other physical and social characteristics of the SBE workplace, are emphasised in both the NH&MRC Guide and 'VDUs at work'.

The NH&MRC is currently considering an occupational health guide covering this subject. In the interim however, aspects of the working environment which should be kept in mind include:

(i) The new range of standard furniture which is suitable for use in a wide range of environments. For example a version of the standard C1/C2 chair fitted with a gas lift cylinder to allow rapid and easy adjustment can be made available when the need exists. The layout of the furniture should ensure that a suitable workspace is provided and that maximum postural comfort is attainable relative to the use of the screen-based equipment. Departments should check the Furniture Manual[3] as amended from time to time before finalizing the requirements for new installations.

(ii) Special Department of Finance approval is no longer required when curtains or other suitable window treatments are required to diffuse excessive light reflections and glare on the screen or keyboard.

(iii) Other factors for consideration include;

Use of colours
Noise control
Temperature/Humidity/Air Flow characteristics
Lighting levels (eg artificial vs natural)
Keyboard operation eg layout, spacing, travel & response.
Screen characteristics eg contrast.

Advice on technical aspects of the fitting out or modification of specific SBE installations (other than the equipment itself) is available from the Department of Housing and Construction.

(e) Compensation Aspects

Instances of fatigue, postural and/or visual problems may, if not rectified, lead to compensable conditions arising from the working conditions.

It is in the fundamental interests of employees and management that such conditions and their consequent incapacities be prevented as far as practicable. Such action should be consistent with currently accepted standards, and the need to balance costs against risks.

(f) Staff Participation

Introduction by departments of new or revised procedures involving the use of SBE should be undertaken in conjunction with proper consultation with staff employed in its operation. Such action should accord with the spirit of the guidelines on joint staff/management consultation on technological change in the Australian Public Service (which should continue to be followed in detail in appropriate circumstances).

(g) Attachment 'A' lists some key attributes of a VDU and the workstation which are drawn to the attention of departments. These have been taken from the source documents referenced and are not to be seen as technical recommendations of the Board. The documents mentioned should be consulted for further details.

Reference Documents

1. Occupational Safety and Health Publication 'At Work' Series No 13: 'VDUs at work' AGPS. This document is expected to be published shortly.

2. National Health and Medical Research Council Occupational Health Guide: Vision and Eyesight Tests for Visual Display Terminal (VDT) Operators; 90th Session October 1980.

3. Commonwealth Standard Furniture Manual; Public Service Board, Canberra.

4. Commonwealth Department of Health, Australian Radiation Laboratory Information Bulletin No 1, April 1978: 'The Video Display Unit and X-Radiation'.

5. The following Standards Association of Australia publications provide further authoritative advice on matters associated with VDU use:

- Australian Standard 2466-1981: Guide to the Design of Microform Workstations.

- Australian Standard 1680-1976: Code of Practice for Internal Lighting and the Visual Environment.

- Australian Standard 3159-1976: Electronic Sound and Vision Equipment.

6. There are many overseas publications which comment on VDU use. One which may provide useful reading is 'Human factor aspects of visual display unit operation' by Colin Mackay. Health and Safety Executive Research Paper No 10. London: Her Majesty's Stationery Office. 1980.

B.R. Hamilton

B.R. Hamilton
Secretary

KEY TECHNICAL ATTRIBUTES DESIRABLE IN RELATION TO OPERATION OF SCREEN-BASED EQUIPMENT

These key attributes are indicated in particular by the NH&MRC Guide and the publication 'VDUs at Work', as desirable in relation to the development of a model working situation; they are not mandatory prescriptions. Their application in particular workplaces will need to have regard to the specific operational requirements of the work and to considerations of practicality; eg single units may require different treatment from group installations, while modifications to existing arrangements may need to be treated differently from new installations. The attributes specified as desirable at this stage are therefore a guide to be supplemented by reference to more detailed publications referred to, and to other relevant standards as they become available. Chief Officers are also encouraged to consider as appropriate to their needs more detailed guides for internal management, eg, in relation to noise attenuation and glare treatment.

ATTRIBUTES OF THE EQUIPMENT

The keyboard should conform to a standard layout and to be detachable, where practicable.

The keys should conform to the following requirements:

- key top = dished profile with minimum reflection
- key force = 0.25 - 1.5 Newton
- key travel = 0.8 mm - 4.8mm
- key size = 12 mm - 15 mm square
- key centre spacing = 18 mm - 20 mm

Important function keys should be colour coded.

Character(s):

- should be clear and of constant density. Character height should not be less than 1/200th of the viewing distance, with a minimum of 3mm;

- height to width ratios should be between 1:1 and 1.0 : 0.85;

- height to stroke width ratio should be 8:1-10:1;

- spacing should be 20%-50% of character height.

The screen should be either coated or etched to minimise reflection.

The minimum refresh-regenerate rate of the phosphor should be 50 Hertz.

Radiation levels measured at the screen face should be

10 MHz to 20 MHz	-	1.0 mW/cm^2
20 MHz to 300 MHz	-	0.2 mW/cm^2
300 MHz to 300 GHz	-	1.0 mW/cm^2

ATTRIBUTES OF THE ENVIRONMENT

- Noise should be as low as possible, preferable 55 Db(A) for high levels of concentration, and 65 Db(A) for routine task areas.
- Heat dissipation should not be directed towards any operator.
- Room temperature should be 21-23° C, Relative Humidity 45-55% and air movement 0.1 m/sec.
- The angle of viewing should be 20° downwards to the screen.
- Lighting intensity: 100-200 lux; luminescence ratio 4:1 of background light.
- Ideal viewing distance 330-550 mm.
- Chairs should be at least 450 mm wide x 360 mm deep; the height of the back should be 80-150 mm above the seat, and the concavity should have a radius of 320 mm.

OFFICE OF THE PUBLIC SERVICE BOARD
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National Circuit, Canberra, A.C.T. 2600
Tel: 72 3977

Reference: 83/3129

27 September 1983

All Departments and Statutory Authorities
State Public Service Boards and
Staff Organisations

PUBLIC SERVICE BOARD PAPER - REPETITION STRAIN INJURIES

Attached for information is a copy of a paper prepared for the Public Service Board by an internal Working Party on Repetition Strain Injuries (RSI).

The paper addresses administrative matters including the handling of RSI cases and the need for increased awareness of the problem amongst a wide range of staff throughout the Public Service. The medical aspects and treatments of RSI are not analysed in detail since those subjects are properly the province of others with appropriate expertise. However, some commonly held views are noted as background information.

The paper does not represent a formal position taken by the Public Service Board, but is being circulated to departments and authorities at this stage as a potentially useful contribution to consideration of the issues involved in RSI. Consultations with agencies and staff associations are in train, with a view to implementing some of the recommendations made, and assessing the suitability of others.

Comments on the report will be welcomed and should be addressed to:

The Secretary
Office of the Public Service Board
McLachlan Offices, National Circuit
BARTON ACT 2600

Attn: Employment Conditions Branch

B.R. Hamilton

B.R. Hamilton
Secretary

Encl

REPETITION STRAIN INJURIES

REPORT BY JUNIOR WORKING PARTY

PUBLIC SERVICE BOARD

SEPTEMBER 1983

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Appendix. A refers to Operational Arrangements

Appendix. B refers to Staffing Procedures

Appendix. C refers to Training

Appendix. D - Working Group's terms of reference.

1. Introduction

In October 1982 the Board agreed to the formation of a Working Group to study the problems presented by repetition strain injuries in the Australian Public Service. The Group comprised representatives from all Divisions and the Melbourne Regional Director's Office. Terms of reference for the Group are shown at Appendix D.

1.2 The Working Group has made suggestions for action in keeping with the Board's role and responsibilities. The recommendations reflect the fact that this is a subject area not well understood at present, but one which appears likely to be studied in detail as it assumes importance in the near future. Technical judgements have therefore been avoided and the recommendations aim to:

(i) raise awareness of the problem in the APS;

(ii) publicize generally accepted commonsense procedures which may help to limit the RSI problem, and;

(iii) suggest means for facilitating inter-departmental communication on the subject.

2. Physiology

Repetition Strain Injury (RSI) is a term which encompasses a wide range of complaints affecting several different areas of the body. The injuries are often encountered in types of work where particular repetitive movements and/or fixed postures must be maintained for long periods of time.

2.2 Tendon inflammations such as tenosynovitis in the wrist are typical examples of the injuries commonly referred to as RSI. Such injuries are usually attributed to continual specific movements involving a good deal of force or speed. There is another type of injury which may afflict people doing repetitive work, due to the need for them to endure a static load on certain muscle groups as they maintain a fairly rigid working posture. These postural stresses may induce back pain, headaches or other tension-related complaints as well as contributing to the other injuries mentioned above. Some medical authorities see these static stresses as the more important side of the problem and therefore prefer to use the term "overuse injury" rather than "repetition strain injury" because the latter term tends to ignore the static causes . While this report will retain the term "repetition strain injury" for convenience, it should be remembered that the injuries and causes discussed are not exclusively involved with movement.

2.3 Repetition strain injuries may appear in a variety of ways. Symptoms may be pain, numbness, tingling, swelling or loss of muscle power. In the early stages these symptoms may not appear to be serious and this, together with the fact that external signs are often difficult to detect or are non-existent, makes early diagnosis a problem.

2.4 The best treatment for RSI is agreed to be rest from the factors which aggravate the injury - a period of weeks or months is often needed. However, due to the minor early discomfort, the difficulty in diagnosis and the seemingly disproportionate inconvenience of the cure, work often continues until the pain or disability becomes intolerable. By this time the chances of complete recovery and return to pre-injury productivity are greatly diminished. Medication and surgery do not obtain consistent success as alternative treatments.

2.5 There are claims made for tests which attempt to predict individual susceptibility to RSI, but these have not been proven conclusively and are disregarded by some authorities. At this stage the only generally reliable indicator of susceptibility appears to be a history of related complaints.

3. Psychological Aspects

Recently in the APS there has been a tendency for numbers of RSI cases to be reported in the same workplace within a short space of time while other similar workplaces remain relatively unaffected. The Working Group therefore thought it necessary to consider whether any psychological factors could be influencing RSI occurrence.

3.2 RSI incidence does not follow the events which have occurred in documented cases of psychogenic illness. The severe physical disabilities and identifiable symptoms present in a number of cases demonstrate a clear physiological basis for the complaint. Even though some reported cases may not prove to be genuine, there is no reason to suspect that a significant number of them are purely psychological.

3.3 However, there is evidence to suggest that mental stress can lead to the tensing of muscles and to other physiological responses which may eventually increase the chances of RSI. Morale and job satisfaction are important factors in this respect. Occupational health workers from the Capital Territory Health Commission believe that lack of job satisfaction may be an underlying problem in keyboard work areas - feelings of isolation and lack of control over workload, rest periods and relevant management decisions have been noted.

3.4 This type of psychological problem may also influence the way in which RSI is reported. Occupational health workers have noted that many people may suffer from RSI symptoms without recognizing them as such or without wishing to bring them to the attention of management. These people may only report their injuries after others in their workplace have identified similar problems or when dissatisfaction with their work situation leads them to press complaints which they may not otherwise have bothered with. In this way a series of reports may occur in one workplace within a short space of time.

4. The Public Service Problem

(a) Current emphasis on keyboard work

The size of the RSI problem in the Service is not clear since recording procedures are generally not designed to take particular note of repetition strain injuries and diagnosis of complaints as RSI is not consistently accurate or clear-cut.

4.2 There does not appear to have been a reliable survey of the number of RSI cases in the Public Service. In September 1981 Mr Les McMahon asked a series of parliamentary questions * concerning the number of cases of tenosynovitis and carpal tunnel syndrome. The replies listed over 450 cases in Departments and Statutory Authorities, but the absence of any consistent time frame meant that no indication was given of the number of cases active at any one time. From the point of view of this report the usefulness of the answers was further limited by the fact that statistics for keyboard areas were not separately noted.

4.3 A report from the Joint Council Sub-committee on Women in the Service, recommending procedures for standardized recording of future RSI cases, has been referred to the Board for examination in consultation with the Department of Health. In view of the work in progress on this subject, and in keeping with its terms of reference, the Working Group has not addressed itself to the problem of standardized reporting arrangements. However, it considers that such arrangements could readily be incorporated in the recommended procedures for handling RSI cases detailed in Appendix B.

4.4 The area which has had most recent and intensive attention relating to RSI is the keyboard area. Visual Display Unit (VDU) operators have drawn special consideration due to the fact that theirs is a relatively new work area where standards are still being developed. Typists, keypunch operators, steno-secretaries and other keyboard operators face similar work situations with regard to RSI.

* Parliamentary Question No.3010-3035 of 1981.

4.5 With increasing use of VDU equipment expected in the near future, the associated RSI problems may gradually take on more importance. With a greater number of different officers becoming regularly engaged in some form of VDU work (albeit not in the same intensive way as DPOs are today) the incidence of RSI may correspondingly increase.

4.6 It is acknowledged that RSI is by no means restricted to keyboard workers. However, the information available to the Working Group concentrated heavily on the keyboard area. Because of this and the fact that the Working Group was convened in response to problems arising with keyboard workers, it was decided to direct the Group's activities towards the problems of keyboard work rather than to attempt a superficial examination of the wider RSI problem.

(b) Developments

4.7 There is a good deal of literature available on the various potential health hazards of all types of keyboard work. Unfortunately much of the literature lacks supporting evidence and there is an absence of authoritative practical investigation into the ways in which keyboard duties affect the operator.

4.8 The most useful body of information available to the Working Group was the transcript of evidence presented during the recent industrial dispute in the Australian Taxation Office. The opinions of several experts on occupational health and safety and the experiences of keyboard operators were made available during the hearings. Most of the medically expert witnesses agreed that there are a number of possible causes of RSI and that these may act independently or in combination, with their relative importance being determined by the particular duties, work environment and operator concerned. These witnesses also pointed out the lack of authoritative investigations, which meant that reliance had to be placed on the subjective opinions of various individuals.

4.9 There are some studies now underway which may remedy this lack of objective information. Dr G.A. Ryan of Monash University's Department of Social and Preventive Medicine is to head a two year study of DPOs in the Service, which will attempt to document the occurrence of repetition strain injury in relation to a variety of factors in the work environment. On the basis of these findings the study will aim to recommend methods for the prevention of RSI.

4.10 The Commonwealth Institute of Health is also planning a study of keyboard staff in the Department of Health. This study will be supervised by Professor D A Ferguson and Ms B J McPhee, who are recognised as two of the leading Australian authorities on RSI.

4.11 Officers from the Mental Health Branch of the Capital Territory Health Commission make visits to RSI-prone work areas in ACT offices to hold discussion sessions with groups of workers. The sessions consist of an initial talk about the physiology of RSI and the things which may cause or aggravate it, followed by discussion of specific problems raised by the participants. Information is given concerning ways in which the employees may improve their chances of avoiding RSI, such as attention to posture, adjusting furniture and equipment etc. The CTHC people tend to view RSI as one factor in the larger problems of lack of job satisfaction and lack of attention to worker's needs. The evidence given by expert medical witnesses in the Tax case indicates that there is a logical basis

for this approach (a number of witnesses mentioned the possible effects of tension). It is understood that the feasibility of a study of psychological and physical factors in the working environment of keyboard staff in a number of Canberra departments is being discussed by the Mental Health Branch with the Physical Working Environment Branch of DEIR and the Department of Health.

5. Operational Arrangements

Management has control over one of the major causes of RSI - the working arrangements under which keyboard operators perform their duties. The chances of avoiding RSI may be enhanced if operating procedures take account of the factors which have been recognised as contributing to the problem.

5.2 It is doubtful whether sufficient consideration is given to RSI in the important planning stages of the introduction of new equipment or systems. Appendix A(I) explains some of the considerations which should be taken into account to ensure that new operations limit RSI as far as possible.

5.3 As well as the fundamental arrangements which can be introduced when new systems are planned, there are a number of relatively simple steps which can be taken to improve working conditions for keyboard operators so that RSI is prevented. Examples of these are listed at Appendix A(II). They are considerations which may be applied to virtually any management system.

5.4 The Working Group considers that in the interest of Service-wide efficiency, greater awareness of RSI should be promoted among the groups of officers (listed at Appendix A(III)) who have control over the design and operation of keyboard areas. The Working Group therefore recommends :

(i) that the PSB convene one or more seminars for departmental officers (as listed in AIII) to discuss the RSI problem and methods of limiting RSI incidence (e.g AI and AII). These seminars could take the form of a presentation of important points from a panel of experts from the PSB, Health, DEIR, Housing and Construction (and perhaps others with special experience such as Tax), followed by a question and answer session to enable departments to raise their own particular problems. The seminars should be held for Regional as well as Central office staff.

(ii) that a brief (1/2hr) information package be produced by the Board's Office (in consultation with qualified experts and staff organisations) which will outline the importance of the RSI problem and the ways in which ergonomically sound operating procedures may be developed. Such a package could then be presented to a variety of groups as part of EDS courses, ADP Directors' conferences, Second Division seminars or other meetings. This may serve to make management generally more receptive to the needs of officers concerned with overcoming the RSI problem.

As a further step to promote awareness at the higher management levels, the working group recommends;

(iii) that the matter of repetition strain injury be placed on the agenda for a future Permanent Heads' Meeting (points to be raised could include latest developments and implications of Tax Office dispute, availability of DEIR, DH&C officers as consultants, measures to be implemented by PSB, views of staff organizations etc.)

6. Staffing Procedures

(a) Recruitment

Given that medical opinion notes the difficulty in shaking off RSI symptoms and their characteristic of recurring even after extensive periods of rest, the possibility of screening applicants for keyboard positions warrants consideration. Recruiting an officer to a position with duties which have led to serious health problems for that officer in the past would seem undesirable from both management and staff viewpoints. The working group therefore recommends that consideration be given to specifically requesting details of any history of RSI during the routine medical examination of recruits - with CMOs to make special note of any anticipated problems with repetitive work.

6.2 Such a step would require initial consultation with RSOD and the Department of Health in order to decide whether it will be possible to make reliable judgements on a recruit's health risk with respect to RSI, and whether such judgements will be practicable within the requirements of the recruitment process. It should also be noted that unions are reported to be opposed to RSI predictability testing (as mentioned earlier, reliable physiological tests have not been found) and requests for RSI history details may be regarded in the same light.

(b) RSI Cases

6.3 The procedures for handling RSI cases need to strike a balance between the need to continue to productively employ the officer concerned and the need to avoid the possibility of worsening the injury. It must be noted that the staff under consideration are skilled operators who may not generally be inclined to accept transfers to positions which will not employ their skills. Although procedures must ensure that an operator's health is safeguarded, if operators view the procedures as putting an end to their keyboard work cases may not be readily reported and so may not come under notice until they are too far advanced for effective measures to be taken. Therefore, procedures for handling RSI cases should clearly have the return to normal skilled work as their ultimate aim, with permanent redeployment or invalidity retirement being noted as the outcomes which the procedures are designed to avoid.

6.4 In a few cases it may be found that the need for action under the Commonwealth Employees (Redeployment and Retirement) Act (the CE(RR) Act) cannot be averted. It should be noted that the procedures for dealing with cases under the CE(RR) Act have as their primary goal, redeployment. Retirement is considered only rarely, where redeployment does not prove practicable, eg where the officer concerned is not found to be efficient for alternative duties.

6.5 Suggested procedures are set out at Appendix B. The Working Group recommends that these procedures, which are based on those in operation in the Melbourne Taxation Office, be circulated to Regional Directors for comment. Following the inclusion of such comments and the revision of the procedures, the Board may wish to issue them as advice to departments. The role of CMOs in confirming diagnoses of RSI and making recommendations about temporary or permanent redeployment may need to be taken up with the Department of Health in the context of resource and training needs.

7. Training

The training received by a keyboard operator may have a major effect on subsequent work habits and therefore on the occurrence of RSI. Before commencing work it is desirable to have all keyboard operators properly instructed in the correct use of their furniture and equipment, with special reference to RSI. The CTHC officers mentioned earlier have noted lack of training as a common problem when discussing RSI with keyboard operators.

7.2 The type of initial training which should be provided to keyboard operators includes many points which will not be dependent on the particular equipment to be used. In the interests of consistent training standards, a Service-wide RSI training package could be developed to cover these general points, with departments arranging for a special session on their own equipment to be presented in conjunction with it.

7.3 The training package should extend to cover the issue of the possible effect of keystroke speeds. While the assessment of keystroke rates must be made in the context of a particular working environment, including equipment, rest breaks etc., it has been noted by the Department of Health that rates in the range of 13,000-16,000 keystrokes per hour and upwards may increase the risk of RSI. Hence, operators need to be trained to examine their work patterns, space their work out, recognise signs of fatigue etc.

7.4 The Working Group recommends that the Board sponsor the production of a training package for keyboard operators, dealing with occupational health and, in particular, repetition strain injury. An outline for such a training package is shown at Appendix C.

7.5 Expert opinion during the ATO arbitration hearing has stressed the need for effective follow up of training in this area. One suggestion has been to employ specialist health professionals (eg physiotherapists) to visit departments on a rotational basis for this purpose. It is possible that only a few specialists could produce a very valuable service if employed in this way and the Working Group recommends that the feasibility of such an approach be further investigated in consultation with DSD.

8. Equipment/Environment

There is a wide variety of environmental factors which impinge on the comfort and well-being of keyboard operators - ventilation, lighting, noise control and interior design are examples. The Board's Office brings these matters to the attention of departments through its memorandum on screen based equipment which is in the process of being

updated. The Department of Employment and Industrial Relations and the Department of Housing and Construction are also available to assist other departments by making consultants available to give advice on aspects of work environment, office layout, furniture and equipment design etc.

8.2 Ergonomically designed furniture and equipment may relieve some of the postural strain and the hand and wrist strain associated with keyboard work. The Board's Office has a role, through its chairmanship of the Inter-Departmental Furniture Committee, in ensuring that the range of furniture available to departments includes items appropriate for keyboard work. The IDFC has recently approved a new adjustable chair and table specifically designed for use with screen based equipment - these will be added to the standard furniture range. As has already happened in the Australian Taxation Office, departments may apply to have non-standard furniture approved through the IDFC if their operations impose special requirements which are not met by these standard items.

8.3 The Board's role in this area has been to co-ordinate the activities of departments with functional interests and to see that other departments are informed of the equipment and advice available to them. Since these subjects are directly relevant to the problem of repetition strain injury the Working Group recommends that the Board employ its co-ordinating role in a special effort to raise awareness of the RSI problem among departmental managers.

8.4 This aim could be achieved through the action recommended earlier under 'Operational Arrangements'. Equipment, furniture and the physical working environment would be important considerations in the seminars and the information package previously described.

9. Summary of Recommendations and Implementation

1. Seminars for officers directly involved with aspects of management and planning of keyboard work areas.

   - consultation with MSED, DSD staff to identify discrete 'target' groups of officers (e.g. one seminar for ADP and systems planners, another for manpower planners (establishment, efficiency audit etc);
   - letters to 'expert' departments (Health, DEIR, DH&C) outlining proposal, suggesting points which might be covered and requesting assistance;
   - letters to all departments outlining the proposal and arrangements for first seminar, explaining which officers the seminar will be directed to, and requesting nominations.

2. Information package directed at management, for inclusion in a variety of longer courses.

   - Board's Office to prepare draft of information to be presented and circulate to expert departments for comment (noting that Board's Office will shortly be issuing revised memorandum on use of SBE, after consultation with staff associations).
   - after contents agreed, consultation with RSDD to decide on best method of presentation (e.g. audio/visual or pamphlet, need for qualified expert to be present etc).

3. Place repetition strain injury on agenda for Permanent Head's meeting.

   - inter-divisional consultation to prepare a background paper and briefing note for Board members.

4. Note RSI History in Recruitment Process

   - consultation with RSDD and Health to test feasibility of the proposal (noting the need for consideration of this to proceed having regard to other suggested procedures for monitoring RSI developed through the Joint Council process)

5. Suggested procedures for handling RSI cases.

   - circulate Appendix B to PSB Regional Directors and Department of Health for comment (noting that PSB will consult with staff associations prior to issuing advice on this and other aspects).
   - circulate to departments explaining advisory status of the procedures, with references to other material (such as training packages) which may be useful.

6. Training package for keyboard operators and supervisory staff.

- preliminary consultation with occupational health authorities (through Department of Health) and with DEIR, DH&C, on content of audio/visual segment and the need for qualified people to lead discussion sessions;

- consultation with RSDD to arrange for production of audio/visual segment and engagement of external consultants if necessary (noting developments are already occuring in this area in the ATO in particular, involving consultation with staff organizations);

- prepare handout for all keyboard operators as a day to day reference source on adjustment of equipment, posture etc;

- publicize training package (in conjunction with new procedures - recommendation No. 5).

- consultation with DSD on employment of specialist health professionals to follow up training programs on a rotational basis.

APPENDIX A(I)

MODIFICATION OF SYSTEMS TO ASSIST IN PREVENTION OF RSI

Assumptions

Consideration is not given to eliminating use of equipment related to RSI because, for keyboard technology at least, important gains would be lost. These gains include improvement in services, better information, more cost effective means of undertaking tasks and improved quality of work. Another important aspect is that it is believed that only a proportion of the population will be affected by RSI given proper conditions and therefore stopping use of equipment would be an overreaction.

The APS has no formal methodology for systems and job design but rather a culture which changes over time and varies from organisation to organisation being moulded by general methodology, training and guidelines. Therefore there will be variations between officers and between organisations in current approaches. Any recommendations in this document are in line with this : intended as a guide rather than as a prescription.

Possible changes :

(a) reduction in the use of centralized facilities such as typing pools. (For example as the result of a Joint Management Review, the Crown Solicitor's Division of Attorney-General's are implementing a new system of legal work units where typing and data entry staff are not part of a pool but part of a group with legal and clerical staff);

(b) use of formatted screens for data entry with visual checking for errors with cannot be detected by an edit program (instead of entry as fast as possible with checking being achieved by double entry);

(c) data generated within the Department being entered at VDUs by the people creating the data (practicable only where volumes of data are small)

(d) increase in the use of word processor workstations by steno-secretaries;

(e) specification of relevant ergonomic factors when tenders are requested for office equipment and furniture (and the use of these factors when tenders are evaluated);

(f) provision of non-keyboard jobs associated with keyboard areas (to assist with rotation of staff);

(g) design of jobs in keyboard areas to include some non-keyboard duties (to provide 'built-in' breaks).

(h) greater consultation with keyboard staff at design stage and encouragement of feedback from keyboard staff on existing systems.

ORGANISATIONAL CHANGES TO ASSIST IN PREVENTION OF RSI

For keyboard pool areas :

(a) work grouped into discrete batches so that a break at the completion of each batch is ensured;

(b) batches collected and returned to a central point by each operator, ensuring a change of posture when the built-in break occurs (no delivery of work to operator's desk);

(c) staff rotated to different positions within or outside the pool, to provide relief from keyboard duties or at least some regular change in environment/conditions;

(d) work allocated to groups rather than individuals so that there is less pressure to achieve a fixed individual workload every day;

(e) feedback on individual working rates not to be used to promote competition for continually higher rates or to encourage operators to work at stress-inducing speeds;

(f) rest breaks to be allowed for at operator's discretion rather than fixed times, breaks to be used within a set period - not to be cumulative, rest area to be provided away from the keyboards;

(g) adjustable furniture to be provided, suited to the equipment in use and all operators to be instructed in adjustment of furniture, correct posture etc.

(h) supervisors and staff to monitor area for RSI incidence and make suggestions for improvements on a regular basis,

(i) new operators and operators returning from leave to be introduced on lower workloads and allowed to gradually work up to full productivity.

APPENDIX A(III)

OFFICERS INVOLVED IN SYSTEMS AND JOB DESIGN

In departments :

- user areas, including operators
- establishment and methods staff
- ADP staff (management/planning)
- internal audit staff
- Auditor-General's staff involved in efficiency audits
- senior management services staff who have responsibility for keyboard areas.

In PSB :

- MSED staff and external consultants conducting Joint Management Reviews.
- DSD and RSDD staff involved in job design.

The staff listed above will be found at different levels and with different interests, depending on the operations of each department. After consultation with appropriate PSB staff it may be possible to group together the departmental officers likely to have similar responsibilities so that their particular interests may be addressed at one seminar for each group.

APPENDIX B

Procedures for handling RSI cases

1. Introduction

The purpose of these procedures is to ensure that RSI cases are identified promptly and dealt with in such a manner as to expedite recovery and return to normal duties.

The recommended treatment of RSI requires that as far as possible staff who suffer from it should not be required to perform movements which aggravate the injury. However, it is important that departments have regard to the needs of skilled keyboard operators when a prolonged break from keyboard duties is required. If operators face removal from their accustomed work environment to duties which they may regard as trivial, without the prospect of return to their normal duties, they may choose not to report RSI symptoms and allow the problem to worsen, making eventual recovery more unlikely. Departments should therefore investigate keyboard and related work areas with a view to identifying duties and positions which are unlikely to involve the rapid repetitive movements of keyboard work or to place strain on injured muscles or tendons. Keyboard operators who encounter RSI symptoms may then be temporarily transferred to other duties without the necessity for a complete break from the work area they have been used to.

2. Identification and Diagnosis

(a) Staff should be advised of the potential seriousness of RSI and the nature of the early symptoms. The procedures for handling cases should be set out clearly, with emphasis on return to normal duties whenever possible. Staff should be encouraged to report symptoms early.

(b) Supervisors should be trained to recognize the early symptoms of RSI and, in conjunction with management, should encourage affected staff to consult their own doctor when symptoms appear. Where the employee's doctor diagnoses RSI and recommends sick leave or alternative duties, appropriate action should be taken immediately. The employee should be referred to a CMO to have the diagnosis confirmed. (Injuries incurred in training and the nature of training injuries compared with injuries at a subsequent stage require analysis, particularly as to individual problems and capacity (ie. should the person be a DPO) and these injuries should be specially noted).

(c) If a keyboard operator refuses to seek medical advice it should be noted that the Permanent Head has the power to direct an officer to attend for medical examination by a CMO when there is reason to believe that the officer's health could substantially impair ability to perform normal duties (Clause 15(3) of the CE(RR) Act Administrative Procedures).

3. *Temporary Redeployment*

(a) Where medical opinion states that the keyboard operator may return to work but must avoid certain duties, Management should attempt as far as possible to provide useful work associated with or adjacent to the officer's former work area.

(b) Medical advice on temporary redeployment should contain specific reference to duties which can or cannot be performed by the officer concerned. Specific reference should also be made to a time period after which the temporary redeployment may be reviewed.

(c) When the temporary redeployment period concludes, agreement should be reached as to whether partial or full return to former duties is possible, whether a longer temporary period should apply or whether permanent redeployment is necessary.

(d) Where a dispute arises between the officer's doctor and a CMO, the normal procedures for handling medical disputes should apply.

(e) Where an officer is granted extended sick leave rather than temporary redeployment, the situation should be reviewed after a set period. (this period being agreed to by a CMO)

(f) Where a department is unable to provide useful alternative duties, the case should be referred to the Regional Director, Office of the Public Service Board, who will assist where possible to arrange gainful employment in another department.

4. *Permanent Redeployment*

Where temporary redeployment is unsuccessful in improving the condition the provisions of the CE(RR) Act may be used to arrange to permanently place the officer in a position with duties which can be efficiently and safely performed.

5. *Invalidity Retirement*

In exceptional cases, where the CMO concludes that the officer may not be redeployed to other duties, or where the officer has not been found to be efficient to perform other duties, the retirement provisions of the CE(RR) Act may need to be considered.

6. *General*

In view of the possibility that the CE(RR) Act may eventually need to be applied, departments should bear this in mind throughout the procedures and ensure that, for example, medical examinations are arranged in accordance with the Administrative Procedures of the CE(RR) Act. This will enable cases to be more efficiently resolved.

APPENDIX C

POSSIBLE PSB-SPONSORED TRAINING PACKAGE

The training package is to be aimed at keyboard operators, their immediate supervisors and officers in management positions related to keyboard areas. The training will cover the physiological aspects of RSI, the correct use of equipment, and procedures for dealing with RSI cases. It is suggested that the package be produced in three separate stages which should preferably be presented together but are capable of being presented independently if the situation in a particular workplace requires this approach.

(1) The 'core' of the package should be an audio/visual presentation covering the nature of RSI, its causes, treatments and methods of prevention. This should include:

- physical reasons for the pain/discomfort caused by RSI,
- summary of factors which can cause RSI (tension, posture etc),
- requirements for effective treatment (rest, early diagnosis etc),
- correct posture for keyboard work,
- principles involved in correct adjustment of furniture/equipment,
- need for rest breaks and the specific purposes they should serve (avoiding fatigue, changing posture, stretching muscles etc).

Such a presentation could be made available even to small groups of workers or to groups where no appropriate session leaders are available.

(2) Wherever possible, the audio/visual presentation should be supplemented by a practical demonstration (or at least a full explanation) of the correct methods of adjustment of the particular equipment to be used in the workplace concerned. This should be given by a technically competent demonstrator such as an officer of DH&C, DE&IR or a trained officer in the department concerned. Documentation concerning the proper adjustments and incorporating brief notes on points such as posture, rest, arrangement of the workstation etc should be produced as a handout for each operator's future reference. This would also serve as a guide for points to be covered when very small groups or individuals are introduced to the equipment, probably without the guidance of a trained officer.

(3) The third component of the package should include a lecture/discussion session with a properly qualified occupational health worker. This would enable participants to satisfy themselves on any queries arising from the first two sessions and

would enable a discussion of any peculiarities relating to their working situation. Special reference to the duties and problems of supervisors and management may be appropriate in this session. A PSB representative could also be available to discuss procedures for redeployment etc.

Occupational health workers have noted the need for follow up programs to monitor the use of furniture and equipment and the response to other training aids when they are put to the test in the normal work situation. A follow up program is seen as necessary both to assist operators and to check the effectiveness of this package. One suggestion to be considered is the use of occupational health professionals to periodically visit departments etc on a rotational basis to provide advice on posture, ergonomics or any other health and safety matter. While DPO supervisors can assist in daily follow up of the training package, there is advantage in having outside specialist advice liaising with supervisors and management and talking to operators to pick up potential problems which may not be apparent to untrained officers.

APPENDIX D

WORKING GROUP ON REPETITION STRAIN INJURIES

TERMS OF REFERENCE

A junior working group will be established in the Board's Office with representatives from all Divisions and selected Regional Offices to facilitate communication, to rationalise the gathering of information and statistics, and to canvass policy and procedural issues facing the Board in respect of repetition strain injuries and related conditions. The committee will report to the Board progressively through the Deputy Commissioner with a view to concluding its deliberations not later than 6 months from its inception.

2. Particular activities of the working party will include:

- monitoring work being carried out within the Board's Office in relation to repetition strain injury in order to facilitate communication within the office and to avoid duplication of effort.
- identifying sources of information related to repetition strain injury (eg the physical working environment, technological change in the workplace, personnel procedures)
- collecting information on the subject and monitoring developments in the management of repetition strain injury so as to provide a reference source for Board officers.
- identifying possible problem areas where further policy procedural or advisory initiatives by the Board may be required and making recommendations as to desirable courses of action by the Board in respect of such problem areas.

3. Responsibility will continue to rest with the appropriate Divisions of the Board's Office and Regional Directors for dealing as necessary, with such matters as are currently on hand or may arise in relation to repetition strain injuries.

OFFICE OF THE PUBLIC SERVICE BOARD
McLACHLAN OFFICES
National Circuit, Canberra, A.C.T 2600
Telephone 72 3977

Reference.

10 September 1984

Secretary
Joint Parliamentary Committee for
Public Accounts
Parliament House
CANBERRA ACT 2600

SCREEN BASED EQUIPMENT (SBE)

I refer to your memorandum of 23 July 1984 seeking information on policies and legislation relating to SBE operators.

Pending the formal establishment of the National Occupational Health Commission (NOHSC) - which should take place shortly - the Code of General Principles, Occupational Health and Safety in Australian Government Employment, remains in force. The Code was endorsed by successive Governments in 1975 and 1978 and prescribes responsibilities for 'Head Officers' and employees of departments and for the Departments of Health and Employment and Industrial Relations, but not for the Public Service Board.

While it has no formal role under the Code, the Board is concerned with occupational health and safety issues from the point of view of central personnel agency. In 1981 the Board issued a memorandum to all departments authorities and staff associations drawing attention to sources of authorative advice on issues affecting operators of SBE. More recently, in August this year, a memorandum on the prevention and management of repetition strain injury (RSI) among keyboard workers was also issued. Copies of both memoranda are attached.

No comprehensive statistics are available concerning occupational injury or worker's compensation in specific occupational or injury categories. The Code of General Principles requires Head Officers of departments to keep records of accidents and injuries and to make returns as required by the Department of Labor and Immigration (now Employment and Industrial Relations) but observance of this requirement appears to have lapsed. The NOHSC Secretariat has circulated for comment an outline of a proposed statistical collection system for introduction by the new Commission. A separate reporting system developed through the Joint Council process to record RSI cases is currently under discussion with the relevant unions.

Meryl Stanton
A/g Assistant Commissioner
Industrial Democracy & Working
Practices Branch

OFFICE OF THE PUBLIC SERVICE BOARD
McLACHLAN OFFICES
National Circuit Canberra, A.C.T 2600
Telephone 72 3977

Reference 84/2970

3 August 1984

All Departments, Statutory Authorities and
Staff Associations

REPETITION STRAIN INJURY (KEYBOARD GROUP)

The purpose of this memorandum is to outline interim measures recommended by the Board aimed at the prevention and management of Repetition Strain Injury (RSI). The steps outlined here are based on advice received by the Board, including comments from departments and staff associations, on the Junior Working Party Report of September 1983. There will be further consultations with departments, staff associations and others with expertise in this area and further advice will be issued as these progress.

2. There has been a dramatic increase over the last two or three years in the number of RSI cases in the Australian Public Service, particularly among keyboard staff. Although there is relatively little research information on its occurrence specifically in the keyboard area, RSI has existed as a medical problem for many years, mainly in industry, and there is a body of accumulated knowledge about its prevention and treatment in this context. Many departments will have already taken some actions along the lines described in this circular; all departments and authorities are urged to consider the full range of measures outlined here to minimize the incidence of RSI and facilitate the management of existing cases.

Nature of RSI

3. In a recent article in the Medical Journal of Australia (March 17, 1984) Browne, Nolan and Faithful define RSI as "musculotendinous injuries of the upper limbs, shoulder girdles, and neck caused by overload of particular muscle groups from repeated use, or by the maintenance of constrained postures, which result in pain, fatigue and a decline in work performance."

4. Turning to contributory factors, the article notes that "many factors can combine to tip the balance toward RSI." These include:

- Constrained and inefficient posture; the frequency of repetitive movement; the force used in performing movements; joint position outside a comfortable mid range; faults in the work station, equipment and task design and in maintenance of the equipment; and increased muscle tension associated with mental stress.

- Faulty work organisation, such as the duration of work without rest; bonus and overtime incentives; lack of training; and failure of supervision.

- Delayed reporting of the injury; incorrect or delayed diagnosis; and inappropriate management of the injury. (Reasons for the failure of employees to report early but persistent symptoms may include ignorance of the significance of symptoms; strong work ethics; the fear of losing a job; economic pressure; language barriers; the absence of non-repetitive alternative duties; and the attitude of the supervisor, health personnel and fellow workers).

Management of Existing Cases

5. Early recognition and treatment are essential for the effective management and early return to full employment of affected staff. Departmental policies which are supportive and which emphasize rehabilitation should encourage staff to report symptoms promptly and without undue anxiety.

6. The Board Junior Working Party report on RSI included as an attachment a set of procedures recommended by the working party for dealing with reported/suspected cases of the injury. These procedures have been further developed and are included in this document as Attachment A. Departments are requested to implement these procedures as soon as possible and to advise the Board's Industrial Democracy and Working Practices Branch (telephone (062) 717334) of any significant difficulties encountered. A group of Commonwealth Medical Officers from all States recently completed a special course on RSI conducted in Sydney by the Commonwealth Institute of Health and are available, on a priority basis, to examine staff referred in accordance with the procedures.

Work Environment

7. There is general agreement that the likely occurrence of RSI is closely linked to the degree to which the workplace meets ergonomic standards. This does not apply only to furniture and hardware but to the total work environment including lighting, noise levels, glare, colour, visual relief, work station layout, thermal comfort and ancillary aids such as foot rests and copy holders. Technical advice on these matters is available from Regional Offices of the Department of Housing and Construction and from the National Occupational Health and Safety Secretariat (telephone (062) 459658) and should be sought by departments if any doubt exists as to the suitability of existing arrangements. The attention of departments is drawn to the 'At Work' series - particularly No 13 'VDU's at Work' -issued by the Department of Employment and Industrial Relations, which provide information and advice on working environment matters.
The efforts made by a number of departments to upgrade furniture in keyboard areas are to be commended but three things need to be said:

- firstly, in some circumstances existing furniture may be quite adequate provided that other features of the total environment receive attention; and secondly, where new furniture is to be provided consideration should be given to the recent additions to the Commonwealth Furniture Range which have been developed specifically for use with keyboard equipment including VDUs. Advice on the features of these items and their suitability for specific work requirements is available from the Accommodation Section of the Department of Housing and Construction Central Office in Canberra. Thirdly, attention needs to be given to the type of task or tasks to be provided at the workstation.

8. A feature of modern design of furniture and equipment is its adjustability to the physical characteristics of the individual operator. Chairs, work surfaces, copy holders, footrests and terminals may all require adjustment to provide the most effective workstation.

9. It is not enough merely to provide appropriate furniture. It is essential that staff should receive instructions on a continuing basis in the principles of correct posture and practices and the optimum arrangement of their own workstations.

10. The Department of Health is in the process of appointing a small number of physiotherapists who will be available to advise and assist departments in this regard and will be attached to the Department's Regional Offices in Sydney, Melbourne and Canberra. Enquiries about the development of this service can be addressed to the Occupational Health Section (telephone (062) 898793 or 898508) in the Department's Central Office in Canberra.

Staffing/Workload

11. Departments may be faced with a shortage of keyboard staff as a result either of general staffing constraints or of difficulties in recruitment. In such cases it is important not to put undue pressure on existing staff and to avoid increasing the use of overtime. The following measures might be considered:

- actively seeking means of eliminating or reducing non-essential keyboard work, and reducing the frequency of peak loads.

- discouraging re-typing

- applying strict tests of essentiality to the use of 'urgent' labels

- discouraging the use of typed internal minutes

- where appropriate, adopting less rigorous presentation of external correspondence to save re-typing

- using printing facilities for large-scale non-urgent jobs

Job Redesign

12. A comprehensive review of the adequacy of existing keyboard structures to meet the needs of the Australian Public Service is being conducted by the Board's Office. A key issue in the review is the growing pressure for redesign of keyboard jobs to provide more rewarding work and to help prevent physical injury such as RSI.

13. In the course of the review, submissions have been invited from all Commonwealth organisations and relevant staff organisations. Work visits have been undertaken, including State public sector and private sector organisations and extensive discussions have been held with groups of keyboard staff in Canberra and other capital cities. A paper summarising the results of the review so far will be circulated to all interested parties shortly.

14. The scope for redesigning keyboard work is constrained to some extent by the present classification structures. However, even within these structures a good deal can be done and departments are urged to look critically and imaginatively at arrangements for keyboard work. The Board's memorandum of 27 June 1984 "A Guide to Classification Management," should be useful.

15. Wherever it is practicable to do so, work should be organised and arranged to avoid periods of sustained keying by :

- designing jobs in such a way that they include non-keying duties; and
- ensuring that rest pauses are taken when keying duties are sustained.

Rest Pauses

16. Rest pauses should be timed to meet individual needs, but as a general rule there should be no periods of sustained keying activity for more than one hour, when a rest break of 10 minutes should be taken. Rest breaks need to be respected by both management and operators :

- keyboard staff must clearly understand the purpose of the relief period and that it is in their own best interests to use it effectively eg. by the performance of quite different duties or by a brief period of specially designed exercise (information on "pause gymnastics" may be obtained from the Board's Office - (062) 717334). Keyboard staff should be aware that the relief periods are just as much part of their work for the day as is the period spent in actual keying.
- the rest pause should not be deferred at the request of management, by pressure exerted by authors concerned about even urgent work or by keyboard staff seeking to utilise the period for another purpose (eg early release on that day or week)
- staff returning from leave periods of more than about two weeks should have a period of adjustment to enable them to build up gradually to their normal working rates

Support From Other Staff

17. It is also vital for other staff at all levels to understand the serious problems for keyboard staff who may contract repetition strain injury. In particular, they must understand the reason for, and accept the consequence for their own work needs, of the period of relief from keyboard operation given to such staff

- other staff need to understand that the relief periods - even where other duties are not performed - are just as much part of a keyboard operator's work for the day as is the period spent in actual operation;
- there should be no deferral of the relief periods as described above because of work demands and no coercion of or encouragement given to staff during a relief period to resume keyboard operation before the normal time.

Advice Within Departments

18. It is desirable to provide and identify clearly, arrangements in departments (or appropriate departmental units) which enable staff to seek advice on the prevention and handling of RSI matters. The most appropriate focus for this activity will vary from one department to another.

Training

19. At Attachment B to this memorandum is a possible outline of a training session prepared following discussion with representatives of some of the departments who have already conducted similar sessions. Comments are invited, together with suggestions about possible session leaders who might be available to assist a range of departments to run the sessions. Comments may be directed to the Board's Industrial Democracy and Working Practices Branch (062-717334). It is envisaged that union representatives would be consulted by departments in the process of setting up training sessions and would be invited to join in panel discussion on topics such as working arrangements and dealing with cases of RSI when they occur. In addition the Board will arrange training sessions for people in departments concerned with the handling of RSI matters.

Reporting Arrangements

20. Detailed arrangements for reporting RSI cases are being developed through the Joint Council. In advance of these, it would be appreciated if departments and authorities could provide the Board's Industrial Democracy and Working Practices Branch with a brief report of RSI incidence, including numbers of cases reported.

Anne Buttsworth
Acting Secretary

ATTACHMENT A

PROCEDURES FOR HANDLING RSI CASES

INTRODUCTION

AIM

1. The aim of these procedures is to aid the recovery of RSI sufferers so that as many as possible have the opportunity to return to appropriate duties without risk of a recurrence. If this is not possible, the procedures aim to provide redeployment to an alternative position which offers gainful employment at a suitable level without aggravating the injury. The alternative of invalidity retirement is regarded as a last resort and the procedures are designed to avoid such action as far as possible.

2. The recommended treatment of RSI cases rests on 2 major points:

   (i) early reporting of symptoms, and
   (ii) avoiding movements or other stresses which may aggravate the injury.

The success of RSI treatment may depend largely on the stage at which it is reported. It is hoped that these procedures will encourage staff to report symptoms early and thereby improve their chances of complete recovery. It is also hoped that these procedures will assist management to obtain good advice and to act promptly to give affected staff members maximum chance of recovery and to make improvements in the workplace which may prevent further cases.

MEDICAL ADVICE

3. Authoritative medical advice is essential at all stages in an RSI case and should be a key factor in determining departmental action. It may come from the staff member's own doctor or from a Commonwealth Medical Officer. Once the recommendation of a CMO has been obtained, this will normally be the major factor in influencing management decisions on the case (although there may be exceptional circumstances where new information or developments should be given special consideration). Where staff members disagree with a CMO's assessment and provide conflicting specialist medical advice, they have access to established procedures for resolving medical disputes.

CMO VISITS

4. Due to the importance of correct early action in RSI cases, a visit to a CMO will form a routine part of the procedure - serving to confirm each diagnosis, recommend staffing action at appropriate intervals and to establish a data base on RSI cases which may help to identify problem areas. A request to visit a CMO is therefore not an indication that permanent redeployment or retirement is being contemplated. The CMO's role is to help avoid those outcomes. It is important that persons reporting symptoms be seen by a CMO without delay.

HOW CASES MAY ARISE

5. RSI cases will usually arise in one of three ways:

   (i) a staff member will report symptoms to a supervisor or other manager, either before or after obtaining some form of medical advice;

   (ii) a staff member will present a medical certificate which makes recommendations concerning fitness for duty, or

   (iii) it may be suspected that an injury exists due to a staff member's work performance, signs of physical discomfort or other reasons.

INITIAL ACTION WHEN CASE ARISES

6. As soon as any suspected RSI case presents, the supervisor (in conjunction with the Personnel Section or other management officers as appropriate) should immediately arrange:

   (i) any necessary modifications to the staff member's duties or working environment in order to prevent further aggravation of the injury;

   (ii) an urgent appointment to visit a CMO to have diagnosis of the injury confirmed and a review process started; and

   (iii) to consult with the staff member and prepare a brief statement for the information of the CMO, outlining some possibilities for temporary re-assignment should this prove necessary.

   (Management should act on (i) above according to the best available expert advice - which will probably come from the staff member's doctor at this stage).

AWAITING CMO ADVICE

7. If there is any delay at all before recommendations from the CMO are available, the advice of the employee's private doctor (supplemented by any advice from ergonomists, physiotherapists etc which management may have access to) should form the basis for action on the case. It should be remembered that CMOs do not provide treatment, so staff members should always be encouraged to consult their own doctors.

CMO ADVICE

8. The outcome of the CMO's examination will include the following:

   (i) a diagnosis of the injury;

(ii) recommendations for staffing action (appropriate duties, changes to work routine, environment etc);

(iii) the setting of a date for the next review of the case, if needed; and consequent staffing action.

STAFFING ACTION

9. Once the department receives the CMO's assessment the following steps should take place immediately:

(i) consultation with the staff member to discuss the CMO recommendations, the proposed action and the date for review of the case;

(ii) implementation of management's decision in the light of the CMO advice.

REVIEW PROCEDURE

10. At each visit, the CMO will set a date for review of the case (unless a final decision can be made). The CMO should provide detailed advice concerning the nature of any duties or restrictions which should apply until the next review. The length of the review period will be decided by the CMO according to the nature of each case, and the staff member concerned should always be notified as soon as possible of the date for the next review. No one should be given leave or displaced from normal duties without a clear indication of the amount of time involved before further attention will be given to the case.

REDEPLOYMENT

11. Where a department is unable to provide useful alternative duties, on a temporary or permanent basis, the case should be referred to the Regional Director, Office of the Public Service Board, who will assist where possible to arrange gainful employment in another department. In cases where return to normal duties is eventually ruled out as an option, the provisions of the CE(RR) Act will be used to arrange to permanently place the staff member in a position with duties which can be efficiently and safely performed.

INVALIDITY RETIREMENT PROCESS

12. In exceptional cases, where it is concluded that the staff member cannot be redeployed to other duties, or has been found not to have the capacity to perform other duties, the retirement provisions of the CE(RR) Act will be appropriate.

FIXED TERM EMPLOYEES

13. Where fixed term employees who have used all available leave credits are judged to be unfit for work for a significant portion of the proposed fixed term it may be necessary to terminate their engagement. It is for Chief Officers to decide when termination is required. Employees who have their employment withdrawn because of injuries sustained at work are entitled to seek employees' compensation.

14. While redeployment is not an option for fixed term temporary employees, they are of course eligible to apply for other APS employment, subject to normal selection procedures.

OTHER TEMPORARY EMPLOYEES

15. Temporary employees with CE(RR) Act coverage are treated in the same way as permanent officers.

PROBATIONERS

16. A review of policy regarding keyboard staff who contract repetition strain injury during the probationary period is at an advanced stage and departments will be advised of the outcome as soon as possible.

PUBLICATION OF PROCEDURES IN THE WORKPLACE

17. Staff should be advised by management of the procedures which will apply in their department when an RSI case is identified. The procedures should be clear and readily available for reference by all staff. Emphasis should be placed on the fact that the aim of the procedures is to return staff to normal duties whenever possible. The potential seriousness of the problem and the importance of prompt recognition should be noted, with encouragement to report symptoms early. Supervisors should be trained to recognize the early symptoms of RSI and should be conversant with the procedures to assist staff in this respect.

INVESTIGATION OF CAUSES

18. The supervisor or line manager should attempt to identify contributing causes for each case of RSI and should examine such factors as job design, suitability of equipment and adequacy of training.

SUPPORT

19. It is common for staff suffering from RSI to experience feelings of low self esteem and anxiety. Supervisors should take time to ensure that each person affected is fully aware of the help available and the procedures to be adopted and should for example refer to the services provided by departmental welfare officers and other agencies who are available to provide emotional support as well as information and practical advice on how to cope at work and at home.

CHECKLIST FOR HANDLING RSI CASES

Preparation

Investigate the immediate work area and other areas of the department as necessary to assess the potential for temporarily re-assigning staff to duties which will not aggravate RSI.

When a Case is Reported

(i) counsel staff member as to her/his situation, procedures to be followed and help available;

(ii) modify duties, workload or equipment so that injury is not further aggravated;

(iii) recommend that the staff member seek treatment from a private doctor (if this has not already happened);

(iv) arrange for the staff member to see a CMO without delay;

(v) prepare a brief statement, in consultation with the staff member outlining some of the possible duties should temporary re-assignment be necessary - this may assist the CMO in making specific recommendations.

(vi) continue to monitor the staff member's duties while awaiting CMO recommendations - make any necessary changes, based where possible on expert advice;

(vii) when the CMO recommendation is available, re-assess the case in consultation with the staff member and make further changes to duties etc if necessary;

(viii) inform the staff member of the date when the case will be reviewed (a review date should form part of the CMO's recommendations);

(ix) when the CMO recommends that the case be finalized, action should be taken to: (a) return the staff member to duty (with modifications if necessary), or
(b) permanently redeploy the staff member or as a last resort,
(c) start retrenchment/retirement processes.

Ongoing Action

Workplaces subject to RSI should be investigated and improved wherever possible to reduce the occurrence of injuries. Staff with RSI should receive sympathetic attention to alleviate anxiety and possible loss of self-esteem. Provision of internal welfare facilities or referral to outside support agencies may be useful.

Contacts for Further Advice

PSB Industrial Democracy and Working Practices Branch	062-717334
National Occupational Health and Safety Secretariat	062-459658
Department of Health (regarding occupational health services)	062-898793

DRAFT OUTLINE - RSI TRAINING PACKAGE FOR STAFF AND SUPERVISORS

Set out below is a possible outline of a training session prepared following discussion with representatives of some of the departments who have already conducted similar courses. Comments are invited, together with suggestions about possible session leaders who might be available to assist a range of departments to run the sessions. Comments may be directed to the Board's Industrial Democracy and Working Practices Branch (062 717334).

A THE NATURE OF REPETITION STRAIN INJURIES (to be presented by qualified health professional)

1. WHAT DOES RSI MEAN?

- explain the range of injuries covered by the term RSI
- note alternative general names such as 'overuse injuries'
- emphasize importance of postural stresses as well as just movement injuries
- note the range of factors which may contribute to RSI

2. PHYSIOLOGY OF THE INJURIES

- briefly explain the physical mechanism for some injuries (eg. tenosynovitis)
- especially note injuries which may have occurred in, or are of interest to, the group involved
- note the long term effects which untreated RSI may induce

3. RSI SYMPTOMS

- explain the 3-stage concept in RSI
- note relative severity of each stage and importance of treating RSI in its early stages
- note the nature of early symptoms

4. TREATMENT OF RSI

- note the importance of rest - give examples of types of injuries and periods of rest required.
- explain other forms of treatment and their usefulness
- emphasize need to seek treatment early
- explain likelihood of recurrence
- emphasize that rest in this instance means rest from anything which aggravates the injury, and that domestic duties, sport etc may be sources of aggravation as well as keyboard work
- discuss psychological reactions which may result from RSI and the limitations it places on physical activity at home and at work

B THE PREVENTION OF REPETITION STRAIN INJURIES (to be presented by qualified health professional, with management and union representatives present to answer questions about the particular workplace).

1. WORK ORGANIZATION

- as much variety as possible should be included into keyboard jobs, either through various daily duties or regular rotations
- explain importance of relief from keying and that this can be obtained by turning to other duties as much as by 'rest breaks'
- note that staff should space out work and maintain comfortable speed rather than try to finish early
- note need to inform management of unreasonable expectations about workloads or deadlines
- explain usefulness of exercise/relaxation activities during breaks

2. FURNITURE AND EQUIPMENT

- explain the principles of good keyboard posture
- have some of the office's furniture on hand and give a practical demonstration of how to adjust it to achieve good posture; demonstrate use of footrests
- explain desirable lighting conditions and ways to achieve them
- note other environmental questions - temperature, noise etc.
- note that training should occur whenever new furniture or equipment is introduced
- demonstrate correct use of document holders and other equipment

C DEALING WITH RSI CASES (to be presented by departmental representative, with health professional and union representative present to join in discussion.

1. PROCEDURES

- outline the procedures which the office will apply in RSI cases
- ask staff whether they have reservations about reporting symptoms or have any problems with procedures
- outline proposals for temporary reassignment of injured staff - seek suggestions

2. MEDICAL ADVICE

- explain need to see private doctor for treatment
- note CMO role is to assist recovery and allay fears that CMO visit is to facilitate retirement (note need for consistent diagnosis/management records/advice on temporary reassignment - all provided by CMO).
- explain medical dispute procedure and how to initiate it.

3. SEVERE CASES

- explain when permanent redeployment or retirement are considered
- explain the process of redeployment/retirement
- note possibility of redeployment to C.A. positions
- explain how compensation claims may be initiated
- explain prospects for retraining/redeployment

4. COPING WITH RSI

- discuss difficulties which can be created by RSI in personal life
  - domestic obligations
  - feelings of frustration/inadequacy
  - difficulty in obtaining complete rest
- note possible support
  - internal support (eg welfare officers)
  - community support groups
  - welfare agencies
  - legal aid, union support.

PRESENTATION OF THE TRAINING PACKAGE

1. VIDEO

- A video presentation should discuss the general principles noted in Section B. These could then be expanded in discussion with the health professional. The video should also include a summary of the material in Section A. (Please note any videos which you consider already provide a good presentation of material relevant to this training package).

2. PRESENTERS

- a qualified health professional should be present throughout the training session to ensure that technically correct information is provided. (Comments on qualified people known to departments would be useful)
- it is suggested that representatives of both management and staff organizations should be present during the discussion of work organization, equipment etc.

3. HANDOUTS

- two handouts are suggested for the day to day reference of operators
  - one handout would summarize the information related to Section B - posture, equipment adjustment etc.
  - one handout would summarize the information in section C - this handout should be circulated before the training session so that discussion can occur on queries and problems rather than having a lecture on details.

JOB STRUCTURES FOR KEYBOARD WORK :

NEW DIRECTIONS ?

A report from the Public Service Board's working party on the review of keyboard structures in the Australian Public Service.

August 1984

JOB STRUCTURES FOR

KEYBOARD WORK : NEW DIRECTIONS?

A report from the Public Service Board's working party on the review of keyboard structures in the Australian Public Service.

August 1984

FOREWORD

The working party was set up by the Board towards the end of 1983 to review keyboard structures in the Australian Public Service.

Since then we have examined submissions from most agencies in the Service and visited a number of Commonwealth, State and private sector organisations. We acknowledge the hospitality extended to us and express our thanks for the help we received through those visits.

We also extend our thanks to the keyboard staff who met with members of the working party in Canberra and in State capitals and particulary to the members of a "keyboard practitioners' panel" in Canberra. Those contacts have been most important in sharpening the focus of the review and shaping possible new directions.

We take this opportunity also to record the value of the contribution made to the working party by the late Ruth McDonald who died in May this year. Ruth enriched everything she was involved in and it was a pleasure to know and work with her.

Trevor Barnes
For the Working Party

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- Options for Change
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  - Option 2 - Amalgamation of Existing Keyboard Structures
  - Option 3 - Further Use of Clerical Assistant Structure for Keyboard Work
  - Option 4 - Integration of Most Keyboard Work into the Clerical Assistant Structure

Option 5 - Integration of All Keyboard Work into the Clerical/Administrative and Clerical Assistant Structures

PART A - INTRODUCTION

Purpose

1. This review is being undertaken to assess whether the existing keyboard employment structures meet the needs of the Australian Public Service (APS) as the basis for employing keyboard staff.

2. The focus of the review is on structures i.e., the rules for the arrangement of keyboard jobs by types and levels.

3. The main aim is to remedy any defects in the structures. This is the starting point in the design of better jobs. In conjunction with this review, the Board is making changes in other areas affecting keyboard employment in the APS, such as staff development, staff selection, occupational health and working environment.

4. This paper is largely descriptive. It is divided into two main sections. The first contains Parts A to E which include:

- a brief description of the jobs found in the structures under review
- an outline of major problems which were brought to the attention of the working party
- a list of the main issues and areas of criticism raised by agencies and keyboard staff in submissions or discussions.

The last section, Part F - New Directions, explores some possible options for changes in keyboard structures. This section in particular is intended to encourage further consultation with interested parties.

Structures

5. A significant feature of the structures included in the review is that there is a separate employment structure for each of a number of different types of keyboard-based work. The structures are:

- Data Processing
- Typing, including Word Processing
- Secretarial.

6. Keyboard work is also undertaken by staff located in a number of other employment structures, including Accounting Machinist, Computer Operator, Clerical Assistant and Clerical/Administrative. The most important of these, for the purpose of the review, is the Clerical Assistant structure. In recent years there has been a considerable increase in the number of Clerical Assistant staff performing a mixture of keyboard and clerical support work, the keyboard work being indistinguishable from that done by staff located in the keyboard structures.

Key Issue

7. A key issue that has been raised is whether the present distinctions between the different types of keyboard work performed in the APS should be maintained. This issue arises in response to recent developments in technology which have considerably blurred traditional distinctions between types of keyboard work based on the type of equipment used.

8. For instance, whereas data processing and typing work have been readily distinguishable in the past, equipment now in use in the APS allows the operator to choose between data processing and word processing mode at the flick of a switch. Where an operator undertakes a mixture of data processing and word processing on the same machine it is necessary to choose between the two different employment structures available, neither of which is fully suitable as the location for such a mixed job of work. Similarly the distinction between Typists and Word Processing Typists is becoming blurred as the clear distinction between an electronic typewriter and a word processor is eroded through progressive enhancement of the functional capabilities of typewriters.

Public Policy

9. The Government has said that "quality of administration is as much a public policy issue as are the programs being administered" (Second Reading Speech, Public Service Reform Bill 1984, 9 May 1984). As a corollary the quality of working life of APS staff may be treated as a matter of public policy concern.

10. From this perspective there is a public policy component to decisions on the design of keyboard employment structures and on the design of individual jobs of work. An issue that emerges from this line of thought is whether the APS should continue to offer traditional keyboard-based jobs of work.

11. At the extremes the choice is beween having all keyboard work done by a corps of skilled experts who do nothing else, and having keyboard work fully integrated into wider work processes with all staff members of an organisation doing their own keyboard work. Present practice both in the public and private sectors in Australia is ranged along the continuum defined by these extremes.

12. The keyboard structures in the APS encourage the specialisation of staff on keyboard and non-keyboard work. Nevertheless, there is evidence of an increasing preparedness to experiment with less traditional organisational and job design e.g., outposting of keyboard staff, mixing keyboard/clerical jobs of work. Decisions on the types of keyboard-based jobs that should be offered in the APS and on the classification rules to apply to these will largely determine the course of job design in this area and the quality of working life that may be experienced by keyboard staff.

Methodology

13. All Commonwealth organisations and relevant staff associations were invited to make submissions to the review. Submissions have been examined and follow-up discussions and visits undertaken with selected organisations including State public service and private sector organisations. Extensive discussions have been held in Canberra with a group of keyboard staff experienced in most aspects of the keyboard work under review. This group, which has met regularly with the working party, has made a valuable contribution as a source of first-hand advice and information on keyboard employment matters. Discussions have also been held with small groups of keyboard staff in Sydney, Brisbane, Hobart and Darwin.

Observations

14. The working party makes the following observations as contextual material for the remainder of this paper.

- The APS relies heavily on keyboard services. Keyboard work is involved in the performance of most, if not all, activities of Government. There is an ever-increasing reliance on computer-based systems which, in turn, depend on keyboard services for data entry, manipulation and retrieval.

- For at least the next decade it can be expected that the administration will continue to require the services of a large corps of staff proficient in specialised keyboard duties, although they may not be exclusively employed on such duties. Developments in technology and increased use of keyboards by non-specialised keyboard staff are unlikely to alter the position.

- There is increasing opportunity within the APS to integrate keyboard work into wider work processes. This can be a two-way process: specialist keyboard operators may be deployed on a mixture of keyboard and other work; or many staff who have traditionally relied on keyboard staff for keyboard services may do some or most of this work themselves.

- Technological change has blurred distinctions between the existing keyboard jobs and is making it increasingly difficult to maintain separate, equipment-based distinctions between different kinds of keyboard work.

PART B - GENERAL BACKGROUND - KEYBOARD WORK IN THE AUSTRALIAN PUBLIC SERVICE

KEYBOARD WORK

Description

15. This section of the paper briefly describes the jobs of work included in the structures covered by the review.

Typing

16. Typist, Grade 1 - this is the base level entry grade in the typist employment structure. It involves typewriting using an electronic or manual typewriter. An entry condition is a minimum typing speed of 30 words per minute (wpm) with a maximum error rate of 2%. This is also the standard for higher level typing positions.

17. Typist, Grade 2 - this level involves more difficult typing. The emphasis in typing is on complexity in format and layout, not on speed. It may also involve limited writing and transcription of shorthand. A condition on promotion to a position requiring shorthand skills is the ability to write shorthand at 80 wpm and transcribe it accurately.

18. Typist, Grade 3 - this level involves writing shorthand to record verbatim the proceedings of conferences etc. An employment condition is the ability to write shorthand at a minimum speed of 140 wpm.

19. Typist Supervisor, Grade 1 - involves typing duties at the Typist, Grade 1 or Grade 2 level and supervision of at least three other typists.

20. Typist Supervisor, Grade 2 - involves supervision of 20 or more other typists.

21. Typist Controller, Grades 1 and 3 - positions at these levels exercise management responsibilites over all typing services in an organisation where word processors are not used.

Word Processing

22. Word Processing Typist, Grade 1 - involves the performance of all tasks associated with the operation of a word processor.

23. Word Processing Typist, Grade 2 - involves operation of a word processor, performance of procedural tasks associated with the maintenance and control of a word processing system, and/or provision of advice on the use of word processors.

24. Word Processing Supervisor, Grade 1 - involves word processing duties at the Word Processing Typist, Grade 1 or Grade 2 level and/or supervision of at least three other word processing typists.

25. Word Processing Supervisor, Grade 2 - involves supervision of a word processing unit where there are at least 6 keystations and a number of printers operating in a shared logic system.

26. Typist Controller, Grades 2 and 4 - positions at these levels exercise management responsibilities over all typing services in an organisation where word processors are used.

Data Processing

27. Data Processing Operator-in-Training - involves instruction and on-the-job training in the operation of data preparation equipment and procedures used in the employing department.

28. Data Processing Operator, Grade 1 - this is the base level operating grade in the data processing structure. Trainees are promoted to this level on successful completion of the course of training. This level involves using a keyboard to enter data for processing by a computer. Keying is from simple or precoded documents and involves one or a limited number of procedures. An employment condition is ability to operate a typewriter or other alpha-numeric keyboard at a speed of not less than 30 wpm.

29. Data Processing Operator, Grade 2 - involves using a keyboard to enter data for processing by a computer. Keying is from simple or precoded documents involving a wide variety of procedures or from complex or variable documents involving some interpretation and coding by the operator. An entry condition is successful completion of the test that Grade 1 staff must pass to qualify for a proficiency allowance - a keystroke rate of 10,000 keystrokes per hour processing typical alpha-numeric material and a written test (10 minutes for 10 questions on procedures and equipment used in the the candidate's work area).

30. Data Processing Operator, Grade 3 - involves using a keyboard to enter data for processing by a computer or leading hand in a pool of Grade 1 and/or Grade 2 operators. Leading hand positions are created on the basis of 1 for every 10 subordinate positions. Typing at this level is from documents involving substantial interpretation and coding of their contents by the operator.

31. Supervisor (Data Processing), Grade 1 - involves supervision of a pool of 3 to 20 Data Processing Operators.

32. Supervisor (Data Processing), Grade 2 - involves supervision of a pool of 21 to 38 Data Processing Operators.

33. Supervisor (Data Processing), Grade 3 - involves supervision of a pool of more than 38 Data Processing Operators.

Secretarial

34. Steno-Secretary, Grade 1 - involves writing and transcribing shorthand, typing and secretarial duties for one or more senior officers. Usually involves typing material for other staff in a branch. An entry condition is the ability to write shorthand at a corrected speed

of 100 wpm. Positions at this level are usually created on the basis of one for each Senior Executive Level 1 or Level 2 position.

35. Steno-Secretary, Grade 2 - involves similar duties and the same entry condition as for Grade 1 positions. Positions at the Grade 2 level are usually created on the basis of one for each Senior Executive Level 3 or Level 4 position.

36. Personal Secretary, Grade 1 - involves the performance of secretarial duties for a Senior Executive Level 5 or Level 6 officer. Typing and writing and transcribing shorthand may be involved but are not essential. Only one position is provided for each eligible Senior Executive officer.

37. Personal Secretary, Grade 2 - involves similar duties as for Grade 1 positions. Only one position at the Grade 2 level is provided for each Secretary of a department.

KEYBOARD STAFF

Statistics

38. This section of the paper contains a brief statistical overview of keyboard staff in the APS.

Numbers

39. At 31 December 1983 there were about 11,400 staff employed in the following categories of keyboard positions:

-	typing	6620
-	word processing	960
-	data processing	2050
-	secretarial	1770

40. Numbers in these areas have grown by about 35% over the past 10 years. This compares with growth of 15% for the APS as a whole over the same period.

Gender

41. Over 99% of the keyboard staff covered by this review are female. The number of male keyboard staff increased from 40 to 75 between 1977 and 1982. As at December 1982 there were no male personal secretaries or word processing typists.

Length of Service

42. The median length of service of all keyboard staff increased from 2.4 years to 4.3 years in the period 1973 to 1983. Changes for each of the keyboard employment categories were as follows:

-	typing	- 1.9 years to 3.4 years
-	data processing	- 3.2 years to 4.5 years
-	secretarial	- 4.6 years to 6.3 years

43. The median length of service is greater at higher levels in the various employment categories e.g., the median length of service for a Typist, Grade 1 is 2.5 years but for a Typist Supervisor, Grade 1 it is 12.5 years.

PAY RATES

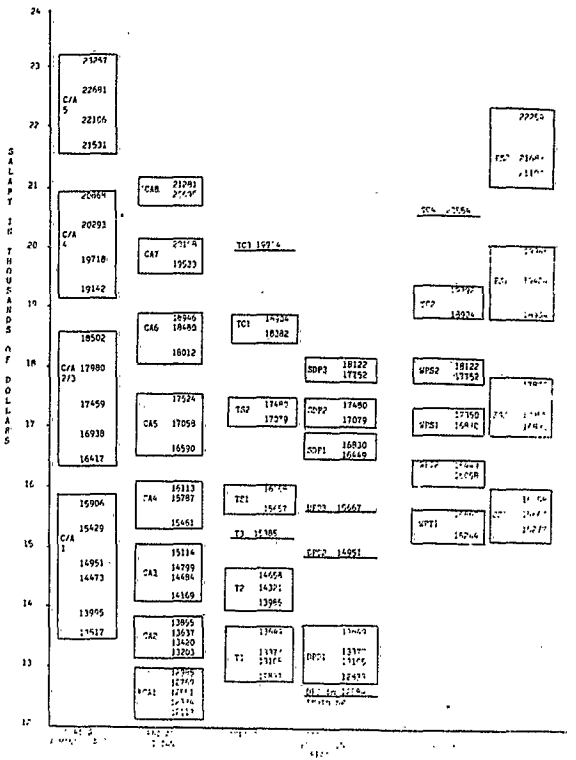
Annual Salaries

44. Annual pay rates for each of the types of jobs covered by the review are set out in the table at page 8. Pay information for the Clerical/ Administrative and Clerical Assistant structures is included in the table, for comparative purposes. This is relevant because of the increase in recent years in the number of positions in the Clerical/Administrative and Clerical Assistant structures performing mixed clerical and keyboard functions.

Key Point

45. A key point to note is that the pay rates in the different keyboard structures and the Clerical/Administrative and Clerical Assistant structures are not aligned. This complicates lateral movement of staff, particularly where movement from a keyboard job to a clerical job is necessary on occupational health grounds e.g., where a keyboard operator contracts repetition strain injury and must be re-deployed either temporarily or permanently.

SALARY RATES; KEYBOARD CLERICAL/ADMINISTRATIVE AND CLERICAL ASSISTANT DESIGNATIONS



* The lower three pay levels are those for staff without [illegible]

Note: While the bars are aligned correctly at the top and bottom of the pay ranges, the figures are only approximately aligned with the points after [illegible]

OCCUPATIONAL HEALTH

Focus of Review

46. Occupational health has been raised as a major issue in keyboard-based employment in the APS. In response to this, one concern of the review is the relationship between occupational health and the design of keyboard employment structures and individual jobs of work. In particular, whether the types of jobs that may be used to employ staff to do keyboard work and the way keyboard staff are organised and expected to do their work expose these staff to an unacceptably high risk of physical injury such as repetition strain injury.

47. This review does not debate the merits of different views on the causes of work related physical injuries amongst keyboard staff. The working party has accepted, however, a direct link between keyboard work and the physical injuries commonly associated with this work.

Equipment

48. Considerable change has occurred right across the APS in recent years in the type of equipment used by keyboard staff. These changes have occurred not only in typewriters, keyboards and visual display units, i.e., in the basic hardware used by keyboard staff, but also in desks, chairs, lighting, office layout, etc. It is possible to find equipment and associated work practices in the APS stretching along a technological continuum from manual typewriters used to cut stencils to computer terminals used for word processing.

49. The pressure for change has arisen both from the need to update and upgrade work methods and, more recently, in an effort to combat the increasing incidence of physical injuries linked directly to keyboard work. There is however considerable unevenness both in the attitudes of managers and keyboard staff to equipment and office furniture requirements and in the enthusiasm with which new technology has been welcomed.

Job Design

50. Less attention has been paid by the APS to job design than to equipment design as a means of avoiding occupational health problems. This can be attributed to the narrow specification of jobs of work within the keyboard structures and to the gradualist approach taken so far towards the integration of keyboard work with other work processes.

51. The types of keyboard jobs traditionally offered in the APS are ones which involve staff using a keyboard for most, if not all, of the working day. In response to the increasing incidence of physical injuries, compulsory rest breaks and work routines which, for example, require keyboard staff to move from their work place to collect new work, have been introduced by some agencies. While these developments offer some respite from constant keying work they do not involve fundamental change in the nature of keyboard jobs.

ORGANISATION

General

52. There are two basic approaches to the organisation of keyboard staff in the APS. Either they are located in pools or they are distributed singly throughout the organisation. A variety of approaches has been developed within the framework of these models e.g., small decentralised pools (say 2-3 staff), combinations of large pool (say 10 or more staff), small pools and distributed staff, and so on.

Pools

53. Pooling of keyboard staff using similar machines to do similar work is a long-established approach to the organisation of keyboard work.

54. The pool provides a service to the entire organisation and allows for the maximum utilisation of equipment. Manuscripts to be typed, statistical data to be entered into a computer, etc., are prepared elsewhere in the organisation and routed to the pool for processing.

55. The simple idea underlying this approach is that authors should spend their working time on what they do best e.g., writing reports, preparing statistics, assessing returns, etc., and that the keyboard component of, for instance, preparing a final report should be done by a specialist keyboard worker. Grouping keyboard staff is convenient for purposes such as work distribution, setting priorities, training and supervision.

Decentralisation

56. Distributing keyboard staff throughout the organisation is seen as a way to increase their involvement in the work of the organisation. Under this arrangement keyboard staff can get to know both the people working in a discrete area of the organisation and the work of the area, and each can operate as a member of a work team.

57. While the separation of work into keyboard and non-keyboard elements is maintained, the isolation of keyboard staff from the day-to-day work processes of the organisation may be broken down. This is a less convenient arrangement from the viewpoint of managing the use of all keyboard staff, but allows functional units to set their own priorities for their keyboard work and allows keyboard staff to contribute directly to the work effort of a group of familiar colleagues.

Integration

58. In recent years there has been some movement towards the integration of keyboard work with other work processes. Rather than separate keyboard and non-keyboard components of a work process and allocate those to different jobs, both components are fused into the one job of work.

59. It is possible to identify three broad groups of jobs of this kind. The first group is conventional keyboard jobs whose occupants do

some clerical work. This mix of work has been accepted in the APS for many years. The second group is Clerical Assistant jobs whose occupants do some keyboard work. There has been a considerable increase in the numbers in this group during the last decade. The third group is Clerical/Administrative and professional jobs whose occupants do some keyboard work. This group is the smallest of the three at present, but is likely to grow rapidly as departments move further towards computerisation of work processes and office automation.

PART C - MAJOR ISSUES

60. This section of the paper outlines the major issues brought to attention during the review.

Job Design

61. The fundamental issue raised by this review is how the keyboard function should be organised. At an abstract level the choice is between a high level of specialisation in work processes, on the one hand, and wider diversification, on the other. At the extremes this involves a choice between having keyboard work done by specialists who do nothing else, and fully integrating keyboard work into the jobs of all staff.

62. The keyboard structures, the types of jobs they offer and the way in which staff have been organised to do this work in the APS have led to the bulk of keyboard work being done by specialists. This model may best meet the needs of some organisations. However, the design of employment structures and the organisation of work along these lines have contributed to problems drawn to the working party's attention during the review.

63. Structures set the general rules on the arrangement of jobs by types and levels and it is within these rules that agencies have the opportunity to design individual jobs of work. With this in mind, a primary aim of the working party is to ensure that the keyboard structures are flexible enough in the APS to encourage agencies to adopt an approach to organisation and job design best suited to their requirements.

Occupational Health

64. Most submissions made the point that the keyboard structures concentrate keyboard work in specialised keyboard jobs. There was strong support for a structure that offered jobs providing for a greater mix of keyboard and other work as one means of reducing the incidence of physical injuries such as repetition strain injury.

65. There is a wide range of working environment considerations which all need to be taken into account in devising ways to minimise occupational health problems, e.g., working conditions, design of equipment and furniture, lighting, design of automated systems, training, etc. (These matters are being addressed, by the Board and others, separately from this review.) Nevertheless, occupational health experts appear to agree that the incidence of physical injuries suffered by keyboard staff could be reduced through closer attention to job design. This lends support to the suggestions put to the working party that a model offering keyboard staff a wider range of work than is typically available now would help avoid physical injuries.

66. The Board has also taken some steps to bring to agencies' attention factors concerning repetition strain injury. In a paper circulated by the Board in late 1983 aspects of repetition strain injury were

discussed, including current medical developments in determining its causes. A further paper will be circulated shortly.

Redeployment of Staff

67. The paper circulated in 1983 also suggested that staff suffering from work-related injuries be redeployed. However, two major constraints exist on the freedom of departments to redeploy keyboard staff.

68. The first constraint is the problem involved in moving staff sidewards from the various types of keyboard jobs to other jobs in, for example, the Clerical Assistant structure because there are no common pay points. Thus moving between these structures may involve either an increase in pay on promotion, or a reduction in pay on transfer (although salary retention can apply in some circumstances). This constraint in particular would affect the redeployment of keyboard staff suffering from work-related injuries.

69. This constraint also operates on the lateral movement of staff, for any other reason, between different keyboard jobs since there are only a limited number of points at which transfers can occur without requiring pay action.

70. The second constraint arises from the highly specialised nature of most keyboard jobs. Specialisation makes it difficult for keyboard staff to compete for promotion or transfer to non-keyboard jobs and even limits their opportunity to perform different keyboard work e.g., typists are not usually trained to do data processing work. This is a particular constraint on the scope of small organisations to use their limited staff numbers to best advantage and on the ability of all organisations to redeploy staff both for development purposes and for occupational health reasons.

Technological Change

71. Recent developments in technology have had two major effects on keyboard structures. The first is the blurring of distinctions between different types of keyboard jobs as set by present structures. The second is the integration of keyboard work into clerical work processes.

72. Current structures differentiate between jobs of Typist, Word Processing Typist and Data Processing Operator largely on the basis of differences in equipment used for these different types of keyboard work. However, in many systems the same equipment can be used for copy typing, data entry and text editing. The present approach to description of occupational categories cannot accommodate these changes.

73. Employment structures in the APS assume the existence of a clear-cut distinction between clerical and keyboard work but it is clear that this distinction is no long valid in many areas. Many Clerical Assistant jobs now involve some keyboard work; keyboards are also used in some agencies by Clerical/Administrative and professional staff. The incidence of such mixed jobs of work varies markedly between agencies.

Notable examples of areas in which keyboard and clerical work have been integrated are:

- Job Bank in the Commonwealth Employment Service
- Pharmpay in the Department of Health
- Australian Customs Service in the Department of Industry and Commerce
- Prescribed Payments system in the Australian Taxation Office.

Recruitment and Retention

74. Agencies generally appeared quite dissatisfied with present arrangements for recruiting keyboard staff into the APS. This stems in part from difficulties experienced by departments since they assumed responsibility from the Board in 1981 for recruitment of keyboard staff. A key point that has been raised is that job applicants need to approach each Commonwealth agency rather than a central recruitment authority. There are also difficulties in attracting applicants, particularly well qualified and experienced applicants.

75. Most agencies expressed considerable concern about the loss of trained keyboard staff. In particular, the movement of staff to other types of jobs, e.g., to Clerical Assistant jobs in the APS or to jobs outside the APS, were raised. These problems seem to be particularly severe in the State capitals where competition for staff is stronger than in Canberra.

76. There is no comprehensive Service-wide data against which to test what was largely anecdotal and impressionistic information provided in submissions and in discussion. The information available to the working party does not fully support the claims made by departments. However, this information is limited in depth and coverage and is not altogether reliable as a gauge of the severity of problems being faced by departments. It is noteworthy that keyboard staff consulted by the working party see the keyboard structures as less attractive in terms of job design and career opportunities than the Clerical Assistant and Clerical/Administrative structures. This is consistent with the views expressed by departments.

Motivation and Morale

77. Submissions generally referred to low motivation and morale among keyboard staff and widespread job dissatisfaction. Some agencies associated these problems with the nature of the keyboard manipulative task and with narrow job design. Few agencies suggested, however, that low motivation and morale affected the quality of work done by keyboard staff.

78. There was no unanimity in the views expressed by keyboard staff consulted on this question. While they generally agreed that many keyboard jobs are dull and repetitive they did not necessarily see the

work as inherently unsatisfying. Many enjoy their work and put a high value on their keyboard skills.

79. A recurring theme in discussion was the low regard in which clerical staff held keyboard work. The view was expressed that few clerical staff recognise the high level of dedication required of keyboard staff and that this lack of recognition, rather than the nature of the work itself, is a contributing factor to low morale.

80. Keyboard staff also drew attention to their frustration with limited career prospects and the lack of opportunity to expand the scope of their work. Acquisition of clerical experience is seen as important for career development.

81. Another point of dissatisfaction for keyboard staff is the lack of opportunity for involvement in decision making within agencies. Staff said they were not consulted on questions of work arrangements directly affecting them. Lack of consultation extended from issues such as the purchase and location of keyboard furniture and equipment and form design to broader issues such as the re-organisation of their work areas or management practices like output monitoring.

Management of Keyboard Staff

82. The keyboard structures provide for jobs of Typist Controller and Typist Supervisor to exercise management responsibilities over all typing services in an organisation. There is however considerable overlap in many agencies between the role of senior keyboard staff and Clerical/Administrative staff in office services areas. This has given rise to problems of duplication and poor communication in relation to deployment of keyboard staff, setting of priorities, supervision, staff development, etc.

83. Typist Controllers consulted by the working party expressed concern about what they see as interference in the exercise of their management responsibilities. In particular, they criticised what they believe to be uninformed decision making on equipment selection and the working environment of keyboard staff.

84. There is also some tension between present keyboard management arrangements and the practice of outposting keyboard staff. Agencies have identified difficulties in integrating outposted keyboard staff into line areas and, at the same time, keyboard supervisors see practical difficulties in ensuring an equitable sharing of work, appropriate supervision, training and career development opportunities.

85. Keyboard staff emphasised in discussion with the working party that in their view many outposted staff suffer high levels of stress and anxiety. This comes about through the absence of peer support and because, without a keyboard supervisor to set work priorities, the task of coping with conflicting demands has fallen in many cases on junior keyboard staff not well placed to perform this role.

86. A widely held view both of agencies and of keyboard staff is that keyboard staff do not have sufficient opportunity to participate either

in Service-wide training schemes or in the training activities of individual agencies. What training is offered is largely limited to familiarisation with equipment and office procedure. This is usually on-the-job training rather than part of a planned induction and training program.

87. There are no Service-wide staff development programs for which the bulk of keyboard staff are eligible. Keyboard staff find that the limited spaces available on agency-run training courses are filled by other staff before keyboard staff and they feel that they are less likely than other staff to have study leave approved.

88. Another view shared by many agencies, and by typing staff in particular, is that users of keyboard services create unnecessary difficulties for keyboard staff by such things as unreasonable deadlines, confused layout, unclear instructions and illegible handwriting. In addition, many authors have a poor understanding both of the nature of computer-based keyboard procedures in word processing and data processing activities and of the actual capacities of equipment, with the result that their expectations can be far in excess of what is technically possible.

Attitudes

89. The working party draws attention to the attitudes of some people in the APS concerning keyboard employment matters. Although the following observations are largely impressionistic, being based mainly on discussions with keyboard staff, they are also in line with the thrust of comments in submissions about job satisfaction and morale of keyboard staff.

90. In these discussions, many keyboard staff reported that they and their co-workers often felt a high degree of animosity towards senior personnel of agencies who were seen as being indifferent to keyboard staff and too often unprepared to concern themselves directly with issues of keyboard management and operations. Hostility towards the users of keyboard services was also reported. Causes mentioned include:

- attitudes of other staff - the perception of keyboard staff is that they have the lowest status in organisations despite their being highly skilled and of critical importance in the operations of all Government agencies
- location of keyboard jobs in the Fourth Division (until the recent abolition of the divisional structure in the APS)
- pay relativities, particularly with Clerical Assistant jobs which keyboard staff see as unskilled and easy by comparison with their own jobs
- lack of consultation on matters of direct interest e.g., equipment acquisition and office layout

- lack of involvement in management and operations of agencies, including even lack of information on the role and functions of agencies
- supervision that is much closer and often of lower quality than that available to other staff (a criticism often directed at Clerical/Administrative staff with functional responsibility for keyboard services)
- constant pressure from both formal and informal work output monitoring when most other staff in the APS are not subject to such explicit output measurement
- lack of respect and consideration shown by users of keyboard services in a variety of minor ways that serve to reinforce the perceived status differential and detract from the quality of working life of keyboard staff e.g., impossible deadlines, exclusion from social interaction, absence of courteous behaviour, etc.

91. While the working party did not observe behaviour of the type mentioned by keyboard staff, there is some indirect evidence bearing on the attitudes of people responsible for managment of keyboard staff. Examples include:

- Grouping of staff in large pools, some of more than 100 staff, with desks arranged in an "open-plan" area on a traditional classroom design and with a fire-alarm type bell used to signal when it is time to start and finish work or take rest and lunch breaks. The physical working environment of such pools is considerably inferior to that of the bulk of APS staff.
- Low priority accorded to quality and design of keyboard equipment and furnishings. There has been a significant improvement in this area recently, but there is considerable uneveness across the Service.
- Development of automated systems which require large numbers of keyboard staff whose work involves virtually nothing other than high speed keying. Where these systems have been developed there appears to be reluctance at management levels to consider any alternative to what is regarded, in terms of maximising short-term returns, as the most efficient way to get the work done.
- Use of heavy-handed management techniques to maintain keyboard output despite low motivation and morale among keyboard staff e.g., unduly close supervision, issue of radios with earphones to counteract boredom and discourage talking, controlled access to telephones, etc.

- Limitation of training opportunities to the minimum required to operate equipment and understand office procedures.

92. On many aspects of keyboard employment arrangements the working party found that there were no particular views commonly shared by keyboard or other staff. Personal experience and preference determined the views expressed on matters such as:

- whether keyboard staff should be located in pools or decentralised
- optimum size of pools
- level of satisfaction offered by keyboard work
- whether a greater mixing of keyboard and other work would be desirable
- the number of levels that should be incorporated in any new keyboard structure.

Pay Relativities

93. This review is not concerned directly with pay rates for keyboard staff. However, present relativities among pay levels in the structures under review were questioned in many submissions. A particular concern is that the grounds on which relativities were established have been eroded by developments in technology and changes in work requirements.

94. One example is the relationship between the annual pay rates of a Steno-Secretary, Grade 1 and a Word Processing Typist, Grade 1. The pay rates for word processing were struck at a time when it was not foreseen clearly that secretaries would generally be equipped with word processing machines. This is now quite common. Agencies that have so equipped secretaries consider that the increased work value of these secretarial jobs is not adequately recognised by the relativity with jobs of Word Processing Typist, Grade 1. While the top of the range for a Steno-Secretary, Grade 1 is $391.00 above that for a Word Processing Typist, Grade 1, at the two lower points they are effectively the same ($33.00 more at the base and no difference at the mid-point of the range).

95. Another relevant example was drawn to the attention of the working party during discussions in a department. It concerned the comparative work value of word processing over typing or data processing where the word processor was being used to prepare simple form letters. Current classification rules require such a job to be classified at the Word Processing Typist, Grade 1 level (because a word processor is involved), although the work itself would have been more properly classified at the Typist, Grade 1 level. Furthermore, the Word Processing Typist, Grade 1 job receives a higher annual pay rate than Data Processing Operator, Grade 2 jobs ($293.00 at the base and $716.00 at the top of the range) although, in this department, the data processing work involves keying,

under sustained pressure to maintain output, from up to several hundred different types of documents.

96. Again, this pay relationship derives from work value differences established when the new word processing technology was introduced into the Service. Some agencies and staff questioned whether this relationship still remained a fair reflection of the comparative value of the jobs involved.

97. Another concern expressed by keyboard staff is that between structures there are small differences in pay for work which, while different in kind, is broadly comparable in terms of the level of skill, the complexity of activity and the demands of the workplace on staff. The differences suggest a level of precision in the processes of work value comparison which the working party doubts is achievable. The differences are a source of annoyance to keyboard staff who do not understand the grounds on which they are warranted. While these differences are the result of considered decisions taken from time to time in the pay fixation arena, their main practical effects are to:

(a) cause keyboard staff to distrust the pay fixation process; and

(b) serve as an impediment to lateral movement of staff as a response to occupational health problems.

PART D - PARTICULAR ISSUES

98. This section of the paper details particular issues and areas of criticism raised by agencies and keyboard staff.

Data Processing

99. Agencies and staff raised the following points in relation to the Data Processing structure:

- The Grade 1 level is no longer the base level operating grade in the structure. It is used primarily as a training grade and there is virtually automatic advancement of staff who pass the proficiency test to the Grade 2 level. Length of service at Grade 1 is usually no more than 12 months. There are three times as many jobs at the Grade 2 level as there are at the Grade 1 level.
- It is difficult to distinguish in a practical sense between the work performed by a proficient Grade 1 operator and a Grade 2 operator.
- The Data Processing pay scale provides a single pay point with no incremental points at the Grade 2 and Grade 3 levels. This does not provide for recognition of the differences in work performance between experienced and recently promoted staff at these levels.
- There is no apparent rationale for the provision of Grade 3 jobs on the basis of 1 for every 10 subordinate jobs. There are doubts about whether jobs at Grade 3 are warranted in terms of strict operational needs and they provide only limited promotional opportunities (at 31 December 1983 there were 159 Grade 3 jobs and 1514 Grade 2 jobs).
- The number of supervisory jobs (about 170) is too small as a proportion of jobs at the Grade 1-3 levels (about 2350).
- The data processing structure provides little scope for advancement beyond the Grade 2 level and the work experience gained in the structure is of little assistance in achieving advancement in other structures.

Typing, Including Word Processing

100. Agencies and staff raised the following points in relation to the Typing structure:

- Recent developments in technology have led to the use of machines indistinguishable in some respects from word processors. While operation of a word processor attracts higher pay, use of a typewriter with similar functional capacity does not.

- The job of operating a telex machine is usually classified at the Typist, Grade 1 level. New telex machines are being introduced that have some of the features of word processors e.g., memory capacity. In these circumstances this work should be classified at a higher level in the structure.
- Jobs at the Typist, Grade 2 level as used extensively to provide secretarial support to officers classified at Class 10 or Class 11, particularly in State capitals. These secretarial jobs involve functions comparable to jobs of Steno-Secretary, Grade 1, but their occupants are paid at a lower rate because steno-secretarial jobs are provided primarily on the basis of one for each eligible Senior Executive Service officer and not for lower classified officers.
- Occupants of Typist, Grade 2 jobs working in environments where there is a significant use of medical terminology consider that this work is more demanding and should be paid at a higher rate than similar jobs in other environments.
- While there are a few jobs at the Typist, Grade 3 level, little or no use is actually made of these jobs. The reason for this appears to be that sound recording has displaced high speed writing of shorthand as the usual method of recording conferences, etc. There may be no point in retaining this level as presently defined.
- Typist Supervisors and Controllers have extensive managerial and administrative responsibilities that are not recognised in pay terms when compared with higher paid jobs with narrower responsibilities in other structures.
- The distinction between word processing jobs at the Grade 1 and Grade 2 levels is not clear. Technological change has blurred the relevance of the differences relied upon in the present classification rules.
- Further to the last point, there are doubts about whether two levels of word processing jobs are required in terms of strict operational needs.

Secretarial

101. Agencies and staff raised the following points in relation to the secretarial structure:

- The provision of Steno-secretary, Grades 1 and 2 and Personal Secretary, Grade 1 jobs on a largely automatic basis of one for every Senior Executive Service officer involves an inefficient use of limited staff numbers in the APS. Practice in the private sector varies widely, but in the main the ratio of secretarial to senior executive jobs is much lower.

- While the ability to write shorthand at 100wpm is an entry condition for jobs at the Grade 1 and Grade 2 levels, many staff in these jobs make little or no use of their shorthand skills. There is scope for secretarial jobs without mandatory shorthand qualifications.

- Further to the previous point, ability to undertake audio transcription and/or operate a word processor could be alternative qualifications for secretarial jobs.

- There is some tension generated by the dual role performed by most Grade 1 and 2 jobs of secretary to a branch or division head and branch/division typist.

- Present classification rules do not distinguish between jobs at the Grade 1 and Grade 2 levels in terms of work value since their classification is ordinarily tied to the Senior Executive Service jobs to which they are allocated. There may however be a valid distinction based on the role of occupants of Grade 2 jobs in the management and supervision of other secretarial staff.

- Under present arrangements the use of a word processor by a steno-secretary does not attract an increase in pay. This approach represents an erosion in the margin for skill traditionally enjoyed by secretarial staff over non-secretarial keyboard staff.

- There would be merit in exploring an alternative approach to the provision of secretarial support to senior staff, based on the concept of drawing together people with a mix of secretarial, shorthand and clerical support skills in a branch or divisional support cell.

PART E - SOME CONCLUDING THOUGHTS

102. While the focus of this review is on employment structures, this issue cannot be separated from a range of other factors which influence the way keyboard work is done in the Service and which can improve the quality of working life for APS staff overall. Any new set of rules to cover the types of jobs that may be used in keyboard work must be worked out in this context.

103. The working party's activity and this paper contribute to the process of change. Changes in structures by themselves however can do no more than create opportunities for improvement. Real progress can only occur if the people involved in designing jobs and organising work make the most of these opportunities.

PART F - NEW DIRECTIONS

OBJECTIVES

104. In this section of the paper the working party first puts forward what it sees as a set of desirable objectives to be adopted by the APS in connection with keyboard employment. Then it outlines options for change which have been developed with these objectives in mind.

105. While the primary focus of this review is on the keyboard structures (that is, the definition of types and levels of keyboard work), the structures have to be considered within the framework of wider keyboard employment arrangements. For example, questions of career advancement within keyboard employment should not be considered in isolation from the scope for upward movement through other employment structures.

Design of Work Systems

106. The overriding objective is to encourage the design of work systems that harmonise the interests of organisations and staff. This can be broken down into the following more specific objectives.

107. Job Design - To design individual jobs of work that meet the needs of organisations and provide opportunity for people to get the rewards they seek through work.

108. Occupational Health - To provide a safe and healthy working environment for staff.

109. Organisational Role - To provide opportunity for involvement by staff in decisions on job design and how their work is done.

110. Attitudes - To develop an organisational role for all staff that encourages recognition of the worth of all jobs of work and of the people who fill the jobs.

111. Career Development - To provide for reasonable career and development aspirations.

112. Training - To offer training and developmental opportunities to better equip staff to perform their present jobs of work and to enhance their wider skills and general awareness within the working environment.

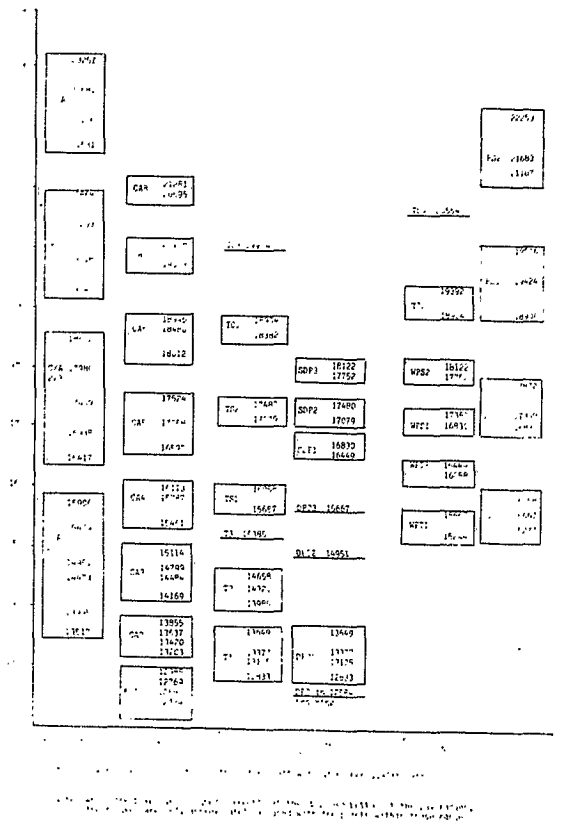
113. Responsiveness to Change - To develop employment structures that can accommodate change in technology and management practice.

OPTIONS FOR CHANGE

114. The working party can see a range of possible options for change in the keyboard employment structures. At the extremes these are:

- to retain present structures with minor adjustments in definition of levels, pay relativities, etc., to resolve pressing operational problems; or
- to integrate keyboard work fully into wider work processes with all members of staff of an organisation doing their own keyboard work.

SALARY RATES; KEYBOARD CLERICAL/ADMINISTRATIVE AND CLERICAL ASSISTANT DESIGNATIONS



Option 1 - Retain Existing Structures with Minor Adjustments

115. This option retains the existing separate structures (Data Processing, Typing including Word Processing and Secretarial) for different types of keyboard work. Adjustments to present structures could include:

- further lining up of pay points among the keyboard structures to make sidewards movement of staff between the structures easier
  - for example, the minimum pay point for Typist Supervisor, Grade 1 is $10.00 less than the rate for Data Processing Operator, Grade 3, the maximum for Word Processing Typist, Grade 1 and the mid-point for Steno-Secretary, Grade 1
- providing incremental salary points in the Grade 2 and 3 levels in the data processing structure
  - below Typist Controller, Grades 3 and 4, there are only three types of keyboard jobs without incremental rates - Data Processing Operator, Grades 2 and 3 and Typist, Grade 3 (rarely used now)
- recognising the ability to do audio typing or to use a word processor as alternatives to shorthand as an entry condition for secretarial jobs
  - although shorthand skills are a pre-requisite for promotion to a secretarial job, many secretaries are not called on to use their skill fully or at all; yet many keyboard staff otherwise suited to the work are denied access to secretarial jobs because they cannot write shorthand
- possible lining up of pay points in the keyboard structures with those in the Clerical Assistant structure
  - although there are 26 pay points in the Clerical Assistant structure between the bottom of the Grade 1 range and the top of the Grade 8 range, and 33 pay points in the keyboard structures between the Data Processing Officer-in-Training pay point and the top of the Personal Secretary, Grade 2 range, there is no single pay point shared between the Clerical Assistant and keyboard structures
  - to make a permanent move sidewards between the keyboard structures and the Clerical Assistant structure (or vice versa) a person must either get a promotion or accept transfer at a lower pay rate (although retention of previous salary may be possible in some transfers)

- possible use of the Typist, Grade 3 pay point for other purposes

  - this could be used as a special pay point for the most demanding jobs presently classified at Typist, Grade 2, such as those used for a wide range of activities (including secretarial work) in small organisations and those in highly specialised technical work areas.

Option 2 - Amalgamation of Existing Keyboard Structures

116. This option creates one keyboard structure through amalgamation of present separate structures. This would cover the Secretarial, Data Processing and Typing (including Word Processing) structures. Features could be:

- a common entry condition to the new keyboard structure

  - the basic entry condition to the working levels in any of the streams of keyboard work would be proficiency in the use of a keyboard at a certain minimum standard

- one set of levels and pay points for all keyboard jobs

  - all keyboard work currently undertaken by jobs in the keyboard structures would be done by jobs classified in one new structure in which a job at, say, Keyboard, Grade 1 would cover typing, word processing or data processing work at the base level

- within a new set of rules on classification of keyboard jobs, the skills required for individual jobs would be clearly stated when jobs were advertised

  - while typing, word processing and data processing at a similar level would be paid within a single scale of pay rates each of these types of keyboard work would require different skills which would be specified for the different jobs of work to be done

  - secretarial jobs could include those with or without shorthand requirements, or with any other skill requirements appropriate to these jobs

- possible lining up of pay points in the new Keyboard structure with those in the Clerical Assistant structure

  - jobs in the new Keyboard structure could be designed to achieve a matching of work value between Keyboard and Clerical Assistant jobs so that pay points for keyboard jobs could line up with those in the Clerical Assistant structure.

Option 3 - Further Use of Clerical Assistant Structure for Keyboard Work

117. This option encourages the use of more mixed clerical/keyboard jobs which could be located properly in the Clerical Assistant structure. It might be linked with either Option 1 or Option 2. Features could be:

- existing separate structures for different types of keyboard work would be retained
  - traditional keyboard jobs would continue to be located in the existing keyboard structures
- within a new set of rules on classification, new jobs designed with an appropriate mix of clerical and keyboard work could be classified in the Clerical Assistant structure
  - a job with a clerical component as low as 20-30%, and a keyboard component of up to 70-80%, could be classified in the Clerical Assistant structure if the extensive use of a keyboard were integral to the job
- the keyboard skills required for individual jobs would be set out when jobs were advertised (as in Option 2)
- a possible lining up of pay points in the present keyboard structures (or in a new keyboard structure) with those in the Clerical Assistant structure (as in Option 1 and Option 2)

Option 4 - Integration of Most Keyboard Work into the Clerical Assistant Structure

118. This option integrates the bulk of keyboard work into the present Clerical Assistant structure. Existing keyboard structures would be abolished and staff placed at equivalent levels in the Clerical Assistant structure, without any reduction in pay currently received. This would involve:

- retaining the existing Clerical Assistant levels and pay scales
  - all staff presently located in the keyboard structures would be translated into the Clerical Assistant (or an appropriately renamed) structure
  - Personal Secretaries could be located in an extended Clerical Assistant structure or, within present structures, in the Clerical/Administrative structure
  - a new set of rules on the classification of keyboard work would be needed as the basis for the design of new jobs and the translation of staff
- provision for jobs ranging between wholly keyboard and wholly clerical support, or any combination of these types of activities
  - while jobs would be classified in the Clerical Assistant structure, informal job titles which would meet the needs of individual agencies or work areas within agencies could be used
- the keyboard skills required for individual jobs to be set out when jobs were advertised (as in Option 2).

Option 5 - Integration of All Keyboard Work into the Clerical/ Administrative and Clerical Assistant Structures

119. This option integrates all keyboard work into the existing Clerical/Administrative and Clerical Assistant structures. Existing keyboard structures would be abolished and staff placed at equivalent levels in the Clerical Assistant or Clerical/Administrative structures without any reduction in pay currently received. This could involve:

- retaining the existing Clerical/Administrative and Clerical Assistant levels and pay scales
  - all staff presently located in the keyboard structures would be translated into either the Clerical/Administrative or Clerical Assistant structures
  - a new set of rules on the classification of keyboard work would be developed as the basis for design of new jobs and the translation of staff
  - re-location of keyboard work into the broader clerical structures would offer the opportunity to redesign jobs used for keyboard work
- broadening of career opportunities
  - the location of keyboard management and secretarial jobs in the Clerical/Administrative structure would improve the opportunities for career progression which the new entry qualifications for Clerical/Administrative jobs (all staff are automatically eligible for entry to the Clerical/Administrative group after 5 years' service) are opening up. The career path could be from skilled keyboard or mixed keyboard/clerical jobs to keyboard supervisory and managerial jobs. From this position, keyboard staff could draw on the managerial skills gained in keyboard supervisory or management jobs to apply for positions with wider Clerical/Administrative responsibilities. Similarly, opportunities would be available for career progression through mixed keyboard/clerical and clerical work in the Clerical Assistant structure.
- provision for jobs ranging between wholly keyboard and wholly clerical support, or any combination of these types of activities (as in Option 4)
- keyboard skills required for individual jobs to be set out when jobs were advertised (as in Option 2)

- possible integration of present Clerical/Administrative, Clerical Assistant and keyboard structures into one new composite structure
  - staff presently located in these structures would be translated into a new broadly constituted "office-based" structure with perhaps no more than 5 or 6 levels. This would remove restrictions on movement between the present structures and would recognise the convergence that is occurring in work and work processes.
  - a new set of rules on the classification of the work done in these structures would be developed as the basis for the design of new jobs and the translation of staff into the two structures.

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Reference 84/2970

3 August 1984

All Departments, Statutory Authorities and
Staff Associations

REPETITION STRAIN INJURY (KEYBOARD GROUP)

The purpose of this memorandum is to outline interim measures recommended by the Board aimed at the prevention and management of Repetition Strain Injury (RSI). The steps outlined here are based on advice received by the Board, including comments from departments and staff associations, on the Junior Working Party Report of September 1983. There will be further consultations with departments, staff associations and others with expertise in this area and further advice will be issued as these progress.

2. There has been a dramatic increase over the last two or three years in the number of RSI cases in the Australian Public Service, particularly among keyboard staff. Although there is relatively little research information on its occurrence specifically in the keyboard area, RSI has existed as a medical problem for many years, mainly in industry, and there is a body of accumulated knowledge about its prevention and treatment in this context. Many departments will have already taken some actions along the lines described in this circular; all departments and authorities are urged to consider the full range of measures outlined here to minimize the incidence of RSI and facilitate the management of existing cases.

Nature of RSI

3. In a recent article in the Medical Journal of Australia (March 17, 1984) Browne, Nolan and Faithful define RSI as "musculotendinous injuries of the upper limbs, shoulder girdles, and neck caused by overload of particular muscle groups from repeated use, or by the maintenance of constrained postures, which result in pain, fatigue and a decline in work performance."

4. Turning to contributory factors, the article notes that "many factors can combine to tip the balance toward RSI." These include:

- Constrained and inefficient posture; the frequency of repetitive movement; the force used in performing movements; joint position outside a comfortable mid range; faults in the work station, equipment and task design and in maintenance of the equipment; and increased muscle tension associated with mental stress.

- Faulty work organisation, such as the duration of work without rest; bonus and overtime incentives; lack of training; and failure of supervision.

- Delayed reporting of the injury; incorrect or delayed diagnosis; and inappropriate management of the injury. (Reasons for the failure of employees to report early but persistent symptoms may include ignorance of the significance of symptoms; strong work ethics; the fear of losing a job; economic pressure; language barriers; the absence of non-repetitive alternative duties; and the attitude of the supervisor, health personnel and fellow workers).

Management of Existing Cases

5. Early recognition and treatment are essential for the effective management and early return to full employment of affected staff. Departmental policies which are supportive and which emphasize rehabilitation should encourage staff to report symptoms promptly and without undue anxiety.

6. The Board Junior Working Party report on RSI included as an attachment a set of procedures recommended by the working party for dealing with reported/suspected cases of the injury. These procedures have been further developed and are included in this document as Attachment A. Departments are requested to implement these procedures as soon as possible and to advise the Board's Industrial Democracy and Working Practices Branch (telephone (062) 717334) of any significant difficulties encountered. A group of Commonwealth Medical Officers from all States recently completed a special course on RSI conducted in Sydney by the Commonwealth Institute of Health and are available, on a priority basis, to examine staff referred in accordance with the procedures.

Work Environment

7. There is general agreement that the likely occurrence of RSI is closely linked to the degree to which the workplace meets ergonomic standards. This does not apply only to furniture and hardware but to the total work environment including lighting, noise levels, glare, colour, visual relief, work station layout, thermal comfort and ancillary aids such as foot rests and copy holders. Technical advice on these matters is available from Regional Offices of the Department of Housing and Construction and from the National Occupational Health and Safety Secretariat (telephone (062) 459658) and should be sought by departments if any doubt exists as to the suitability of existing arrangements. The attention of departments is drawn to the 'At Work' series - particularly No 13 'VDU's at Work' -issued by the Department of Employment and Industrial Relations, which provide information and advice on working environment matters.
The efforts made by a number of departments to upgrade furniture in keyboard areas are to be commended but three things need to be said:

- firstly, in some circumstances existing furniture may be quite adequate provided that other features of the total environment receive attention; and secondly, where new furniture is to be provided consideration should be given to the recent additions to the Commonwealth Furniture Range which have been developed specifically for use with keyboard equipment including VDUs. Advice on the features of these items and their suitability for specific work requirements is available from the Accommodation Section of the Department of Housing and Construction Central Office in Canberra. Thirdly, attention needs to be given to the type of task or tasks to be provided at the workstation.

8. A feature of modern design of furniture and equipment is its adjustability to the physical characteristics of the individual operator. Chairs, work surfaces, copy holders, footrests and terminals may all require adjustment to provide the most effective workstation.

9. It is not enough merely to provide appropriate furniture. It is essential that staff should receive instructions on a continuing basis in the principles of correct posture and practices and the optimum arrangement of their own workstations.

10. The Department of Health is in the process of appointing a small number of physiotherapists who will be available to advise and assist departments in this regard and will be attached to the Department's Regional Offices in Sydney, Melbourne and Canberra. Enquiries about the development of this service can be addressed to the Occupational Health Section (telephone (062) 898793 or 898508) in the Department's Central Office in Canberra.

Staffing/Workload

11. Departments may be faced with a shortage of keyboard staff as a result either of general staffing constraints or of difficulties in recruitment. In such cases it is important not to put undue pressure on existing staff and to avoid increasing the use of overtime. The following measures might be considered:

- actively seeking means of eliminating or reducing non-essential keyboard work, and reducing the frequency of peak loads.
- discouraging re-typing
- applying strict tests of essentiality to the use of 'urgent' labels
- discouraging the use of typed internal minutes
- where appropriate, adopting less rigorous presentation of external correspondence to save re-typing
- using printing facilities for large-scale non-urgent jobs

Job Redesign

12. A comprehensive review of the adequacy of existing keyboard structures to meet the needs of the Australian Public Service is being conducted by the Board's Office. A key issue in the review is the growing pressure for redesign of keyboard jobs to provide more rewarding work and to help prevent physical injury such as RSI.

13. In the course of the review, submissions have been invited from all Commonwealth organisations and relevant staff organisations. Work visits have been undertaken, including State public sector and private sector organisations and extensive discussions have been held with groups of keyboard staff in Canberra and other capital cities. A paper summarising the results of the review so far will be circulated to all interested parties shortly.

14. The scope for redesigning keyboard work is constrained to some extent by the present classification structures. However, even within these structures a good deal can be done and departments are urged to look critically and imaginatively at arrangements for keyboard work. The Board's memorandum of 27 June 1984 "A Guide to Classification Management," should be useful.

15. Wherever it is practicable to do so, work should be organised and arranged to avoid periods of sustained keying by :

- designing jobs in such a way that they include non-keying duties; and
- ensuring that rest pauses are taken when keying duties are sustained.

Rest Pauses

16. Rest pauses should be timed to meet individual needs, but as a general rule there should be no periods of sustained keying activity for more than one hour, when a rest break of 10 minutes should be taken. Rest breaks need to be respected by both management and operators :

- keyboard staff must clearly understand the purpose of the relief period and that it is in their own best interests to use it effectively eg. by the performance of quite different duties or by a brief period of specially designed exercise (information on "pause gymnastics" may be obtained from the Board's Office - (062) 717334). Keyboard staff should be aware that the relief periods are just as much part of their work for the day as is the period spent in actual keying.
- the rest pause should not be deferred at the request of management, by pressure exerted by authors concerned about even urgent work or by keyboard staff seeking to utilise the period for another purpose (eg early release on that day or week)
- staff returning from leave periods of more than about two weeks should have a period of adjustment to enable them to build up gradually to their normal working rates

Support From Other Staff

17. It is also vital for other staff at all levels to understand the serious problems for keyboard staff who may contract repetition strain injury. In particular, they must understand the reason for, and accept the consequence for their own work needs, of the period of relief from keyboard operation given to such staff

- other staff need to understand that the relief periods - even where other duties are not performed - are just as much part of a keyboard operator's work for the day as is the period spent in actual operation;
- there should be no deferral of the relief periods as described above because of work demands and no coercion of or encouragement given to staff during a relief period to resume keyboard operation before the normal time.

Advice Within Departments

18. It is desirable to provide and identify clearly, arrangements in departments (or appropriate departmental units) which enable staff to seek advice on the prevention and handling of RSI matters. The most appropriate focus for this activity will vary from one department to another.

Training

19. At Attachment B to this memorandum is a possible outline of a training session prepared following discussion with representatives of some of the departments who have already conducted similar sessions. Comments are invited, together with suggestions about possible session leaders who might be available to assist a range of departments to run the sessions. Comments may be directed to the Board's Industrial Democracy and Working Practices Branch (062-717334). It is envisaged that union representatives would be consulted by departments in the process of setting up training sessions and would be invited to join in panel discussion on topics such as working arrangements and dealing with cases of RSI when they occur. In addition the Board will arrange training sessions for people in departments concerned with the handling of RSI matters.

Reporting Arrangements

20. Detailed arrangements for reporting RSI cases are being developed through the Joint Council. In advance of these, it would be appreciated if departments and authorities could provide the Board's Industrial Democracy and Working Practices Branch with a brief report of RSI incidence, including numbers of cases reported.

Anne Buttsworth
Acting Secretary

PROCEDURES FOR HANDLING RSI CASES

INTRODUCTION

AIM

1. The aim of these procedures is to aid the recovery of RSI sufferers so that as many as possible have the opportunity to return to appropriate duties without risk of a recurrence. If this is not possible, the procedures aim to provide redeployment to an alternative position which offers gainful employment at a suitable level without aggravating the injury. The alternative of invalidity retirement is regarded as a last resort and the procedures are designed to avoid such action as far as possible.

2. The recommended treatment of RSI cases rests on 2 major points:

   (i) early reporting of symptoms, and
   (ii) avoiding movements or other stresses which may aggravate the injury.

The success of RSI treatment may depend largely on the stage at which it is reported. It is hoped that these procedures will encourage staff to report symptoms early and thereby improve their chances of complete recovery. It is also hoped that these procedures will assist management to obtain good advice and to act promptly to give affected staff members maximum chance of recovery and to make improvements in the workplace which may prevent further cases.

MEDICAL ADVICE

3. Authoritative medical advice is essential at all stages in an RSI case and should be a key factor in determining departmental action. It may come from the staff member's own doctor or from a Commonwealth Medical Officer. Once the recommendation of a CMO has been obtained, this will normally be the major factor in influencing management decisions on the case (although there may be exceptional circumstances where new information or developments should be given special consideration). Where staff members disagree with a CMO's assessment and provide conflicting specialist medical advice, they have access to established procedures for resolving medical disputes.

CMO VISITS

4. Due to the importance of correct early action in RSI cases, a visit to a CMO will form a routine part of the procedure - serving to confirm each diagnosis, recommend staffing action at appropriate intervals and to establish a data base on RSI cases which may help to identify problem areas. A request to visit a CMO is therefore not an indication that permanent redeployment or retirement is being contemplated. The CMO's role is to help avoid those outcomes. It is important that persons reporting symptoms be seen by a CMO without delay.

HOW CASES MAY ARISE

5. RSI cases will usually arise in one of three ways:

(i) a staff member will report symptoms to a supervisor or other manager, either before or after obtaining some form of medical advice;

(ii) a staff member will present a medical certificate which makes recommendations concerning fitness for duty, or

(iii) it may be suspected that an injury exists due to a staff member's work performance, signs of physical discomfort or other reasons.

INITIAL ACTION WHEN CASE ARISES

6. As soon as any suspected RSI case presents, the supervisor (in conjunction with the Personnel Section or other management officers as appropriate) should immediately arrange:

(i) any necessary modifications to the staff member's duties or working environment in order to prevent further aggravation of the injury;

(ii) an urgent appointment to visit a CMO to have diagnosis of the injury confirmed and a review process started; and

(iii) to consult with the staff member and prepare a brief statement for the information of the CMO, outlining some possibilities for temporary re-assignment should this prove necessary.

(Management should act on (i) above according to the best available expert advice - which will probably come from the staff member's doctor at this stage).

AWAITING CMO ADVICE

7. If there is any delay at all before recommendations from the CMO are available, the advice of the employee's private doctor (supplemented by any advice from ergonomists, physiotherapists etc which management may have access to) should form the basis for action on the case. It should be remembered that CMOs do not provide treatment, so staff members should always be encouraged to consult their own doctors.

CMO ADVICE

8. The outcome of the CMO's examination will include the following:

(i) a diagnosis of the injury;

(ii) recommendations for staffing action (appropriate duties, changes to work routine, environment etc);

(iii) the setting of a date for the next review of the case, if needed; and consequent staffing action.

STAFFING ACTION

9. Once the department receives the CMO's assessment the following steps should take place immediately:

(i) consultation with the staff member to discuss the CMO recommendations, the proposed action and the date for review of the case;

(ii) implementation of management's decision in the light of the CMO advice.

REVIEW PROCEDURE

10. At each visit, the CMO will set a date for review of the case (unless a final decision can be made). The CMO should provide detailed advice concerning the nature of any duties or restrictions which should apply until the next review. The length of the review period will be decided by the CMO according to the nature of each case, and the staff member concerned should always be notified as soon as possible of the date for the next review. No one should be given leave or displaced from normal duties without a clear indication of the amount of time involved before further attention will be given to the case.

REDEPLOYMENT

11. Where a department is unable to provide useful alternative duties, on a temporary or permanent basis, the case should be referred to the Regional Director, Office of the Public Service Board, who will assist where possible to arrange gainful employment in another department. In cases where return to normal duties is eventually ruled out as an option, the provisions of the CE(RR) Act will be used to arrange to permanently place the staff member in a position with duties which can be efficiently and safely performed.

INVALIDITY RETIREMENT PROCESS

12. In exceptional cases, where it is concluded that the staff member cannot be redeployed to other duties, or has been found not to have the capacity to perform other duties, the retirement provisions of the CE(RR) Act will be appropriate.

FIXED TERM EMPLOYEES

13. Where fixed term employees who have used all available leave credits are judged to be unfit for work for a significant portion of the proposed fixed term it may be necessary to terminate their engagement. It is for Chief Officers to decide when termination is required. Employees who have their employment withdrawn because of injuries sustained at work are entitled to seek employees' compensation.

14. While redeployment is not an option for fixed term temporary employees, they are of course eligible to apply for other APS employment, subject to normal selection procedures.

OTHER TEMPORARY EMPLOYEES

15. Temporary employees with CE(RR) Act coverage are treated in the same way as permanent officers.

PROBATIONERS

16. A review of policy regarding keyboard staff who contract repetition strain injury during the probationary period is at an advanced stage and departments will be advised of the outcome as soon as possible.

PUBLICATION OF PROCEDURES IN THE WORKPLACE

17. Staff should be advised by management of the procedures which will apply in their department when an RSI case is identified. The procedures should be clear and readily available for reference by all staff. Emphasis should be placed on the fact that the aim of the procedures is to return staff to normal duties whenever possible. The potential seriousness of the problem and the importance of prompt recognition should be noted, with encouragement to report symptoms early. Supervisors should be trained to recognize the early symptoms of RSI and should be conversant with the procedures to assist staff in this respect.

INVESTIGATION OF CAUSES

18. The supervisor or line manager should attempt to identify contributing causes for each case of RSI and should examine such factors as job design, suitability of equipment and adequacy of training.

SUPPORT

19. It is common for staff suffering from RSI to experience feelings of low self esteem and anxiety. Supervisors should take time to ensure that each person affected is fully aware of the help available and the procedures to be adopted and should for example refer to the services provided by departmental welfare officers and other agencies who are available to provide emotional support as well as information and practical advice on how to cope at work and at home.

CHECKLIST FOR HANDLING RSI CASES

Preparation

Investigate the immediate work area and other areas of the department as necessary to assess the potential for temporarily re-assigning staff to duties which will not aggravate RSI.

When a Case is Reported

(i) counsel staff member as to her/his situation, procedures to be followed and help available;

(ii) modify duties, workload or equipment so that injury is not further aggravated;

(iii) recommend that the staff member seek treatment from a private doctor (if this has not already happened);

(iv) arrange for the staff member to see a CMO without delay;

(v) prepare a brief statement, in consultation with the staff member outlining some of the possible duties should temporary re-assignment be necessary - this may assist the CMO in making specific recommendations.

(vi) continue to monitor the staff member's duties while awaiting CMO recommendations - make any necessary changes, based where possible on expert advice;

(vii) when the CMO recommendation is available, re-assess the case in consultation with the staff member and make further changes to duties etc if necessary;

(viii) inform the staff member of the date when the case will be reviewed (a review date should form part of the CMO's recommendations);

(ix) when the CMO recommends that the case be finalized, action should be taken to: (a) return the staff member to duty (with modifications if necessary), or
(b) permanently redeploy the staff member or as a last resort,
(c) start retrenchment/retirement processes.

Ongoing Action

Workplaces subject to RSI should be investigated and improved wherever possible to reduce the occurrence of injuries. Staff with RSI should receive sympathetic attention to alleviate anxiety and possible loss of self-esteem. Provision of internal welfare facilities or referral to outside support agencies may be useful.

Contacts for Further Advice

PSB Industrial Democracy and Working Practices Branch	062-717334
National Occupational Health and Safety Secretariat	062-459658
Department of Health (regarding occupational health services)	062-898793

ATTACHMENT B

DRAFT OUTLINE - RSI TRAINING PACKAGE FOR STAFF AND SUPERVISORS

Set out below is a possible outline of a training session prepared following discussion with representatives of some of the departments who have already conducted similar courses. Comments are invited, together with suggestions about possible session leaders who might be available to assist a range of departments to run the sessions. Comments may be directed to the Board's Industrial Democracy and Working Practices Branch (062 717334).

A THE NATURE OF REPETITION STRAIN INJURIES (to be presented by qualified health professional)

1. WHAT DOES RSI MEAN?

- explain the range of injuries covered by the term RSI
- note alternative general names such as 'overuse injuries'
- emphasize importance of postural stresses as well as just movement injuries
- note the range of factors which may contribute to RSI

2. PHYSIOLOGY OF THE INJURIES

- briefly explain the physical mechanism for some injuries (eg. tenosynovitis)
- especially note injuries which may have occurred in, or are of interest to, the group involved
- note the long term effects which untreated RSI may induce

3. RSI SYMPTOMS

- explain the 3-stage concept in RSI
- note relative severity of each stage and importance of treating RSI in its early stages
- note the nature of early symptoms

4. TREATMENT OF RSI

- note the importance of rest - give examples of types of injuries and periods of rest required.
- explain other forms of treatment and their usefulness
- emphasize need to seek treatment early
- explain likelihood of recurrence
- emphasize that rest in this instance means rest from anything which aggravates the injury, and that domestic duties, sport etc may be sources of aggravation as well as keyboard work
- discuss psychological reactions which may result from RSI and the limitations it places on physical activity at home and at work

B THE PREVENTION OF REPETITION STRAIN INJURIES (to be presented by qualified health professional, with management and union representatives present to answer questions about the particular workplace).

1. WORK ORGANIZATION

- as much variety as possible should be included into keyboard jobs, either through various daily duties or regular rotations
- explain importance of relief from keying and that this can be obtained by turning to other duties as much as by 'rest breaks'
- note that staff should space out work and maintain comfortable speed rather than try to finish early
- note need to inform management of unreasonable expectations about workloads or deadlines
- explain usefulness of exercise/relaxation activities during breaks

2. FURNITURE AND EQUIPMENT

- explain the principles of good keyboard posture
- have some of the office's furniture on hand and give a practical demonstration of how to adjust it to achieve good posture;demonstrate use of footrests
- explain desirable lighting conditions and ways to achieve them
- note other environmental questions - temperature, noise etc.
- note that training should occur whenever new furniture or equipment is introduced
- demonstrate correct use of document holders and other equipment

C DEALING WITH RSI CASES (to be presented by departmental representative, with health professional and union representative present to join in discussion.

1. PROCEDURES

- outline the procedures which the office will apply in RSI cases
- ask staff whether they have reservations about reporting symptoms or have any problems with procedures
- outline proposals for temporary reassignment of injured staff - seek suggestions

2. MEDICAL ADVICE

- explain need to see private doctor for treatment
- note CMO role is to assist recovery and allay fears that CMO visit is to facilitate retirement (note need for consistent diagnosis/management records/advice on temporary reassignment - all provided by CMO).
- explain medical dispute procedure and how to initiate it.

3. SEVERE CASES

- explain when permanent redeployment or retirement are considered
- explain the process of redeployment/retirement
- note possibility of redeployment to C.A. positions
- explain how compensation claims may be initiated
- explain prospects for retraining/redeployment

4. COPING WITH RSI

- discuss difficulties which can be created by RSI in personal life
  - domestic obligations
  - feelings of frustration/inadequacy
  - difficulty in obtaining complete rest
- note possible support
  - internal support (eg welfare officers)
  - community support groups
  - welfare agencies
  - legal aid, union support.

PRESENTATION OF THE TRAINING PACKAGE

1. VIDEO

- A video presentation should discuss the general principles noted in Section B. These could then be expanded in discussion with the health professional. The video should also include a summary of the material in Section A. (Please note any videos which you consider already provide a good presentation of material relevant to this training package).

2. PRESENTERS

- a qualified health professional should be present throughout the training session to ensure that technically correct information is provided. (Comments on qualified people known to departments would be useful)
- it is suggested that representatives of both management and staff organizations should be present during the discussion of work organization, equipment etc.

3. HANDOUTS

- two handouts are suggested for the day to day reference of operators
  - one handout would summarize the information related to Section B - posture, equipment adjustment etc.
  - one handout would summarize the information in section C - this handout should be circulated before the training session so that discussion can occur on queries and problems rather than having a lecture on details.

CSIRO occupational safety & health circular

The Chief
Division of Computing
Research
Black Mountain
CANBERRA ACT 2600

No. 82/5
Ref. PK2/12
15 December 1982

VISUAL DISPLAY UNITS (VDUs)

1. In CSIRO laboratories, offices and workshops an increasing use is being made of equipment featuring an illuminated electronic display and an associated keyboard. The equipment includes computer terminals, microcomputers, word and data processors, type setting terminals and computer aided design and manufacturing stations. A number of possible health hazards have been associated with the sustained use of this type of equipment. The attachment to this Circular contains a review of these possible risks to health and provides advice on how to avoid or lessen the effect of the recognized ones. The topics covered include radiation exposure risks, damage to eyesight, eyesight testing and correction, postural fatigue and general information on equipment, workplace and task design.

2. The information in the attachment has been compiled from a number of sources including those listed as references. Although other opinions exist about some of the hazards mentioned, it is considered that the attachment presents a balanced summary of current expert medical and scientific opinion on the subject.

3. The equipment to which this Circular refers, and in particular the screen and keyboard combination, is commonly referred to by a number of phrases and abbreviations. These include work station, SBE (Screen Based Equipment), VDT (Visual Display Terminal) and VDU (Visual Display Unit). For convenience the abbreviation VDU is used throughout the attachment to describe any equipment incorporating an electronic display and associated keyboard, with the exception of hand held calculators and similar devices. Although the information is specifically directed towards equipment where the display is produced electronically on the screen of a cathode ray tube (similar to a television receiver) some of the advice may be usefully applied to the operation of displays where an image recorded on film is projected optically on to a screen (eg. a microfiche reader).

K. J. Thrift

K J Thrift
Secretary (Personnel)

Enquiries to: G C Barnes Telephone (062) 484440

VISUAL DISPLAY UNITS (VDU's)

What Are the Hazards?

1. Possible direct and indirect risks to health associated with the use of VDUs include radiation effects, photosensitive epilepsy, visual fatigue and postural fatigue. Research has shown that most of the health problems which have arisen are linked to indirect causes. That is, the available evidence suggests they are not caused by radiation generated by the equipment or by other direct influences. Insufficient attention to ergonomic factors (ergonomics - the design of work so that the best use is made of human capabilities without exceeding human limitations) would appear to be a major cause of the problems experienced by many VDU users.

Radiation

2. In common with many everyday items of electronic equipment (the most relevant one being a television receiver) the components in a VDU generate some radiation. This radiation may include X-rays, infrared and ultraviolet from the display tube, and electromagnetic radiation over a range of frequencies. Modern equipment incorporates design features to prevent this radiation penetrating to any significant degree beyond the confines of the equipment case, or screen face. Surveys have been carried out in a number of countries to find out what levels of radiation come from VDUs and to see if VDU users experience a higher than normal incidence of health problems which could be associated with radiation exposure. The conclusions drawn from these surveys, and other studies, is that the levels of radiation from modern equipment are well below the limits currently recognised as safe and that there is no scientifically acceptable evidence that the use of VDUs damages the eyes or eyesight or imposes any risk from radiation. In view of this lack of evidence it is not considered necessary for equipment to be regularly monitored for radiation leakage. However, it is necessary to ensure that new equipment specifications and performance meets the standards for ionizing and non-ionizing radiation exposure which may be set by the National Health and Medical Research Council, the Standards Association of Australia and other relevant authorities from time to time.

Photosensitive Epilepsy

3. A very small percentage of the population has an epileptic sensitivity to flickering lights. A high proportion of these are prone to suffer seizures whilst watching television. Because of the similarities between a television receiver and a VDU the possibility of VDU use precipitating seizure cannot be ruled out. However, the majority of those likely to suffer an attack will have done so before the age of 20 years, the most likely age for the first attack being between 10 to 14. The likelihood of an adult suffering a first seizure whilst operating a VDU is considered to be extremely remote. However, those individuals who knowingly suffer from photosensitive epilepsy should seek specialist medical advice before carrying out any work on a VDU.

Visual and Postural Fatigue

4. Operation of a VDU usually involves, to varying degrees:

Example of a poorly designed workplace causing bad posture

- manipulation of the keyboard;
- observation of the screen; and
- reference to source documents.

For these operations to be carried out in the most comfortable and effective way, attention must be given to matching the equipment and task design to the physical and mental abilities of the user. Consideration must also be given to the layout of the equipment and the provision of a suitable environment. Lack of attention to these ergonomic details may result in users suffering from visual and postural fatigue. Symptoms of visual fatigue are many and various. They include redness and soreness of the eyes, difficulty in adjusting the visual system to view things at different distances, temporary blurring, headaches, and pain in the face and neck. Postural fatigue symptoms include pain in the joints and muscles, a loss of sensation in various parts of the body and temporary loss of strength in the arm and hand.

5. Some of the causes of visual fatigue are:

- small size of observed object requiring the greatest possible effort to see it clearly (eg screen characters too small);
- poor contrast at the observed object;
- glare, that is light illuminating the eye more than the light emitted or reflected from the observed object;
- flickering or uncontrolled movement of the observed object (eg. display instability);
- low level of illumination or uneven distribution of light;
- poor legibility, and poor definition of characters; and
- defective eyesight.

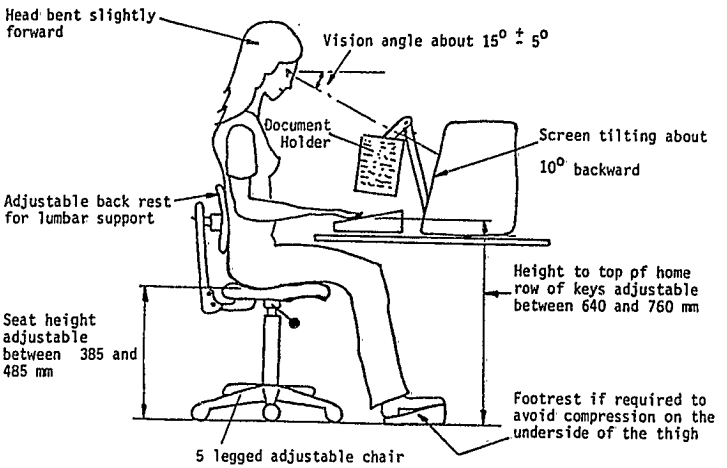
As with visual fatigue, postural fatigue may be due to a number of causes, the primary one being a workplace design that calls for a constrained uncomfortable posture to be held for long periods.

Equipment, Workplace and Work Design

6. The design of the VDU, the tasks to be performed using it and the workplace in which it is to be situated should all take into consideration the needs and limitations of the user, special attention being given to those factors known to cause visual and postural fatigue. In these respects existing workplaces and furniture are often unsuited to sustained VDU use. For example desk tops may be at the wrong height for comfortable working and lighting levels suitable for normal clerical work are often too high for comfortable VDU viewing.

FIG 1

VDU WORKPLACE ARRANGEMENT



The seating positon should ensure that:

- the feet can be placed flat on the floor or other support with the thighs horizontal
- weight is taken on the buttocks and upper parts of the thigh only
- leg movement is not restricted
- there is no pressure on the back of the knees.

The relative heights of the seat and the working surface should be adjusted so that the shoulders are relaxed when the hands are resting on the keyboard. The arms should hang naturally with the angle between the forearm and upper arm at or slightly greater than 90^{o}, so that there is a minimum of wrist bending.

7. Figure 1 depicts a seating position and some of the desirable features of a VDU workplace designed to minimize user fatigue. Other important features which should be incorporated into the design are:

- the height of the desktop, keyboard and display, and the position of the source documents should all be independently adjustable (custom designed furniture may be used to achieve these aims);
- the keyboard should be detachable from the screen so that it can be located in the most comfortable position for the operators' posture and viewing distance from the screen;
- both the keyboard and desktop should be as thin as possible to enable the hands to rest on the keys with the least strain (for the keyboard 30 mm to the home row of keys, and preferably no more than 25 mm thick for the desktop);
- the area of the working surface should be large enough to allow the equipment to be positioned to suit individual preferences and to provide space to rest the forearms and the hands; and,
- the keyboard should conform to a standard layout and the keys should provide audible or tactile feedback.

8. Figure 1 also shows some features of the equipment and its layout related to visual comfort. Other features related to this aspect are:

- the display should present an image to the user that is both clear and stable with adequate colour and/or tone contrast between the characters and the background;
- the screen, document holder and other source material should preferably be placed on a radius, so that they are about the same distance from the user, in order to limit the range over which it is necessary to see clearly;
- the screen phosphors should be refreshed at a rate of at least 50 times per second;
- characters should be clear and easily legible and there should be no confusion between pairs of letters or numerals such as U-V, 5-S, 0-Q, 1-I;
- screen reflection should be minimized by the careful positioning of the equipment with respect to windows and other light sources and if necessary by the use of suitable screen filters or screen treatment;
- all work surfaces, the keyboard and screen surrounds should be matt finished to avoid reflections;
- the use of high reflectance materials in the workplace should be avoided (eg white boards, glass partitions and highly polished floors); and,
- the user should have a clear view away from the screen in order to be able to relax the eyes from time to time.

Visual Environment

9. However well designed and constructed the display is, improper illumination will make both the information on the screen and the source documents difficult to see and result in visual discomfort. The information on the source documents is made visible by virtue of the light which falls on it. The characters on the display are made visible by the light which they emit. The difference is an important one. Lighting levels, from both natural and artificial sources, should be sufficient to read source documents without difficulty whilst at the same time not swamping the light emitted by the characters on the screen. To ensure these conditions are met an appropriate level of illumination for the desktop and working area is 350-500 lux and the luminance ratio between the task area and the general surroundings should not be greater than 4:1. The VDU should be positioned so as to avoid reflections or glare from windows, overhead lighting and other sources. Curtains or other suitable window treatments may be used to diffuse excessive light reflection and glare on the screen or keyboard. Detailed information on the design of the visual environment is contained in the publications 'VDUs at Work' (2) and 'Visual Display Terminals' (3). The CSIRO Buildings and Property Section may also be able to offer assistance on this aspect.

General Environmental Factors

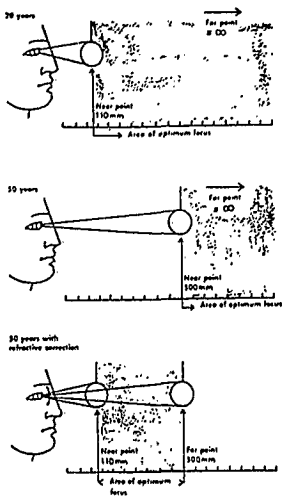
10. In addition to the environmental factors of a VDU workplace already mentioned there are other environmental aspects which may require attention. These include noise levels, thermal comfort and ventilation. Noise levels should preferably be within the range of 45-55 dB(A) or lower. If the task is of a design nature or work which demands concentration then the lower limit is recommended. If it is purely a data entry task than the higher limit may be quite acceptable. Where possible associated noisy equipment such as impact printers should be located away from the VDU area, or acoustically screened. The thermal environment should be controlled and kept within acceptable limits of temperature and humidity. Equipment should be positioned so that dissipated heat is directed away from the user and other staff. Allowance should be made for the effect on air conditioning, or need for increased ventilatilation as a result of the heat generated by the equipment.

Work Design and Rest Breaks

11. The design of the tasks to be carried out using a VDU is an important factor to consider. Preferably VDU-based operations should be designed in such a way that spells of concentrated work at the terminal are spaced throughout the working day. During the remainder of the time non-VDU based work could be carried out. Where this is not practicable users should be given the opportunity to have rest breaks from time to time in order to avoid, or overcome, visual and postural fatigue. The actual frequency and duration of rest breaks may be determined to suit the particular circumstances. However, staff should not operate VDUs continuously for periods longer than two hours without a break.

Eyesight and Eyesight Tests

12. Visual fatigue results from the effort expended in attempting to see clearly. Defects in eyesight will obviously contribute towards this effort. A particular problem is loss of accommodation - the ability to see objects distinctly at varying distances. As the diagrams opposite show this ability usually decreases with age and often staff over the age of 40-45 years may need glasses to read VDU screens and source material comfortably and efficiently. Normal reading glasses may be unsuitable because they are designed to focus the eyes at a distance less than that usually found between the user and the screen. Consequently special lenses may be required, or the use of bifocal glasses may be found to be necessary. However, many of the problems experienced with lack of accommodation may be reduced by careful arrangement of the relative positions of the screen, keyboard and source material to suit the individual.



Accommodation range (the difference between the far and near points of vision) at twenty and at fifty years of age, with and without correction with glasses.

13. Eyesight Testing - as mentioned earlier there is no scientific or medical evidence available to show that VDU use has a permanent effect upon the eyes or eyesight. On this basis there is no particular need for VDU users to have eyesight tests any more often than, or different from those say for clerical workers. Nevertheless, because defective vision can be a cause of visual fatigue arrangements should be made for staff who work substantially full-time on VDUs to have eyesight tests on commencement of work with the equipment and whenever indicated by the onset of symptoms of visual disorders. The NH&MRC occupational health guide 'Visual Display Units' (1) provides a description of appropriate eyesight screening tests. If the testing reveals that corrective lenses or treatment is necessary the costs will not be met by CSIRO but will be the responsibility of the person concerned. This is in accordance with general

practice whereby the responsibility for correcting medical conditions which affect the ability to carry out normal work duties is considered to belong to the individual concerned, except in those situations where the provisions of the Compensation Act apply.

Summary

14. A VDU workplace is made up of a number of components including furniture, fittings, lighting and equipment. In designing the workplace all factors contributing to it should be considered as a whole and not as individual components. A further, and most important factor of all, is to give full consideration to how the VDU user will interact with the workplace and to ensure that the workplace design meets the needs of the user and recognises the users' limitations. This attachment describes some of the desirable features of workplaces satisfying these requirements and suitable for work involving sustained use of the equipment. The extent to which existing workplaces require adaption to meet the optimum requirements for VDU operation depends on a number of factors. These include the number of VDUs involved (single units may require different treatment to group installations) and whether the equipment will be continually used by one person for sustained periods or intermittently by one or more people. Further details on all aspects of the workplace and detailed information on the health hazards which have been associated with VDUs may be found in the following references.

References

(1) National Health and Medical Research Council, Approved Occupational Health Guide, Visual Display Units, Department of Health, Canberra 1982.

(2) Department of Science and Technology, Occupational Safety and Health Working Environment Series 13, VDUs at Work, AGPS Canberra 1981.

(3) A Cakir et al, Visual Display Terminals, John Wiley & Sons, New York, 1980.

(4) Mackay C, Human Factors Aspects of Visual Display Unit Operation, HMSO, London 1981.

(5) Lewis M J, Esterman A J, Dorsch Margaret M, A Survey of the Health Consequences to females of Operating Visual Display Units, Community Health Studies, Vol VI, No.2, 1982.

TELECOM AUSTRALIA

OCCUPATIONAL HEALTH POLICY & GUIDELINES

ISSUE NO 1 - INTERIM

SCREEN BASED EQUIPMENT

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SECTION 1 - INTRODUCTION

1.1 Application of these Guidelines

It is Telecom's policy that every employee shall be provided with a safe and healthy place in which to work. As a complement to that policy the following Guideline has been prepared to assist all parties involved in the planning, introduction and operation of future Screen Based Equipment (SBE), and the provision of facilities to support that equipment.

As SBE is most frequently the only interface with computer based systems, the terminals are the most obvious of the environmental changes brought about with the introduction of new systems, and as such, tend to be the subject of criticism which should be, in some instances, more accurately directed at the complete system.

Despite significant improvements in SBE design there is a continuing need to establish criteria for successful visual display terminal selection and installation. These guidelines establish:

i. broad criteria to assist selection of SBE display terminals (Section 3)

ii. ergonomic criteria for workplace layout, working procedure and posture (Section 4 & 5)

iii. environmental issues relevant to SBE installations (Section 6)

iv. some comments on work organisation and education (Section 7 & 8)

v. procedures relating to the conduct of eyesight tests for staff (Section 9)

There are a wide range of SBE tasks so that generalisation of solutions to SBE implementation problems is not satisfactory. A more satisfactory classification of SBE task categorises the nature of operation, and the period per day of operation, as follows:

1.1.1 Operational Categories

Category A - Operation of keyboard for data entry only, in which the operator keys data from hard copy. Characteristically touch typing is employed with eyes moving from hard copy to screen.

Category B - Operation of keyboard for data entry and information retrieval. The level of typing skill may not be as high as for Category A. The eyes move between hard copy, screen and keyboard.

Category C - Operation of keyboard for data enquiry only. Typing skills required would be equivalent to untrained skill level. Eyes move readily between keyboard, documents and screen.

1.1.2 Time of Operation Categories

Category 1 - Continuous Operation, being the sole - or very nearly the sole - task of the operator.

Examples: Data processing operator, DAS/C Operator, SULTAN operators and testing officers, pool-type WP operators.

Category 2 - Part-Time Operation, where the operator may be continuously in the presence of the equipment, but may only be required to respond on the terminal from time-to-time during the working period. (As an indication, the operation can be considered part-time if terminal work activity ranges between 25% and 75% of the working day).

Examples: LEOPARD operators, private secretaries, STOCKAID operators (operating more than 25% of the day on a terminal).

Category 3 - Casual Operation, where staff may use the terminal from time-to-time to obtain information. Such casual operation would be brief infrequent and irregular. The terminal may be located close by a person's working area, or shared by several staff.

Examples: STOCKAID operators (operating less than 25% of the day on a terminal), time-share terminal users.

1.1.3 Each of the above tasks brings with it different problems relating to, for example, workplace layout, anthropometrics, stress and SBE configuration. There is no single answer that will satisfy every situation, but compliance with these Guidelines will assist in minimising the problems which will inevitably arise.

It is Telecom's long term aim to move away from concentrated SBE operation.

1.1.4 Application to Existing SBE Systems

For both practical and economic reasons it is not possible to apply in total the principles contained in this Guideline to existing SBE systems, or indeed to many systems presently in an advanced stage of implementation where Telecom has already committed itself to the purchase of relevant equipment.

Nevertheless the substance of this Guideline should be considered by management and the health and ergonomic principles, in particular those relating to eyesight testing and work organisation, should be applied to the greatest extent possible.

The approach that should be adopted is essentially a commonsense one which will strike a balance between that which is necessary from an Occupational Health point of view and that which can be achieved having regard to both the practical and economic difficulties that inevitably will be encountered.

For those systems presently in an advanced stage of development, the Project Implementation Team should undertake a comprehensive ergonomic review of the project with a view to incorporating the principles of the Guideline to the greatest extent possible.

1.2 Sources of Information

Every endeavour has been made to research and consider all relevant aspects of SBE design and operation in preparing this Guideline. Included as Attachment 3 is a list of source material which may be consulted if further information is desired. Advice on technical matters associated with the design of SBE systems is available from the sources designated in 1.5.

It should be noted that some of the source material has internal contradictions and where possible the outside data has been supplemented with the results from studies within Telecom.

Some SBE systems such as Computer Aided Design (CAD) draughting equipment do not have characteristics of workplace design and layout which are relevant to this guideline. These cases require specialised advice. This advice is also available from sources designated in 1.5.

1.3 Guidelines Update

This Guideline has been prepared based on the best known information at this stage, and the experience gained from existing installations.

However, with the development of new equipment such as liquid crystal displays and with the continual research being undertaken in regard to the performance of SBE, the information contained in this Guideline will be reviewed and updated regularly.

1.4 Definition

Screen Based Equipment (SBE) is defined as equipment which uses a self-illuminating screen to display information in alphanumeric, graphical or similar form, including combinations of each.

This definition includes visual display terminals, visual display units, microform viewers, screen-based word processors, and personal computers.

This definition excludes television displays, television programme monitors, closed circuit TV systems and similar dynamic displays.

Telecom studies so far have concentrated on cathode ray tube-based Visual Display Terminals (VDT) including associated keyboards.

The Standards Association of Australia has produced a standard AS2466-1981 "The Design of Microform Workstations". This standard provides the necessary guidance to establish the special requirements of a microform installation and should be consulted where necessary.

A Glossary of Terms used throughout these Guidelines has also been included in this document as Attachment 2.

1.5 Further Information

The application of this Guideline to the planning, equipment selection, installation and operation of SBE installations needs to be carefully considered. Further information and advice on the most effective means of application can be obtained from:

1. Project Co-ordinators of each system, within each State or Headquarters.
2. Buildings Sub-Division (Headquarters) for workplace and environmental design, and accommodation policy, and Buildings Branch in each State for application.
3. Information Systems Department (Headquarters), and Commercial Services Department (Headquarters) for SBE and VDT specifications.
4. General Personnel Services for the organisation of eyesight testing.
5. Occupational Health Service for the provision of health education material.

SECTION 2 - HEALTH ASPECTS

The introduction of screen based equipment into the workplace requires full attention to ergonomic and occupational health aspects to ensure the prevention of potential health problems.

Unless proper attention is paid to these aspects, SBE work may impose greater physical and mental demands on staff than other conventional office work and result in:

a. neck stiffness, backache and muscular fatigue;

b. repetition strain injuries of fingers, hands, arms, shoulders and neck;

c. general fatigue and stress;

d. eye strain and associated symptoms such as headaches;

e. skin complaints.

The principles and practices detailed in these guidelines combine to form an effective injury prevention strategy in relation to the above.

Attention has also been focussed on the health effects of exposure to radiation emitted from SBE and possible relationships between such exposure and the formation of cataracts, which could lead to permanent deterioration of vision, miscarriages and birth deformities.

Telecom is of the view based on a number of scientific studies that no relationship between SBE operation and such health problems has been found.

The Staff Organisations however are of the view that the possibility of such links has not been disproved by these studies.

These guidelines take account of the concerns of the Staff Organisations and provide for a joint review of authoritative scientific studies and reports which become available during the next 6 years.

2.1 Effects on Eyesight

Unless SBE systems are properly ergonomically designed, operators may develop headaches and sore and tired eyes following the constant use of SBE systems. Scientific evidence currently available suggests that where these symptoms develop they are reversible and no structural damage occurs as a result of excessive visual work.

It is generally accepted that visual discomfort amongst SBE operators is related to the mismatch between the visual demands of the task and the visual capacity of the operator. The reduction in visual discomfort depends on close attention to this relationship, and this Guideline provides information for the application of ergonomics to the design of the workplace and its layout.

Concern has also been expressed about the health effects of exposure to radiation emitted from SBE. Studies in Australia and overseas on whether SBE contributes to the formation of cataracts, miscarriages and birth deformities has indicated that these effects do not occur with abnormal frequency amongst operators of SBE. In addition the levels of radiation emitted from SBE are extremely small and hence the risk of radiation injury to SBE operators is considered to be negligible. (Refer to Section 3.6).

2.2 Effects on Posture

Unless SBE systems are properly ergonomically designed, operators who perform highly repetitive keying tasks may develop symptoms of muscle fatigue and joint strain in the hands, arms and shoulders.

Special conditions of this type, which are collectively known as "soft tissue injuries", include tenosynovitis, carpal tunnel syndrome, ganglion, tennis elbow and frozen shoulder. Where these conditions have occurred they are reversible if treated early.

Postural problems producing symptoms of muscular fatigue in the neck and back have been associated with fixed postures due to unergonomic workplace design and layout.

2.3 Pregnancy

Pregnant women have the right to request transfer from SBE work on production of a medical certificate which confirms the pregnancy. No loss of basic salary or seniority will eventuate, but no guarantees can be given that alternative work will be available at the same location.

Studies indicate that it is in the first 8-10 weeks of pregnancy that the embryo is at its most susceptible to environmental agents.

2.4 Rehabilitation

In cases where staff develop medical conditions which result in an inability to perform their normal job, every effort will be made by Telecom to rehabilitate staff in accordance with Occupational Health Guideline 5.1 "Rehabilitation Guidelines for Nursing Staff".

SECTION 3 - SBE CHARACTERISTICS

3.1 Introduction

The readability and legibility of the SBE display, together with ease of use of the keyboard, are among the most important criteria for SBE operators.

To ensure good readability, the format of information presentation is as important as the legibility of each character, or group of characters.

The important features for legibility are: character shape, spacing, size, formation and stability; and for readability: format coding, display capacity and position on the screen.

The SBE keyboard, although similar to a typewriter in appearance, has a number of additional functions. For most computer systems the keyboard requires a number of frequently-used function and cursor control keys. These keys usually provide a number of shortcuts when keying. The optimum keyboard design provides a balance between a simple, uncluttered keyboard and a number of these special keys.

3.2 General

3.2.1 Equipment Appearance

The appearance of the cabinet, keyboard, keys and any other associated equipment should be of a matt finish and low reflectivity so that glare and specular reflection is minimised.

No specific colours are recommended, but white and similar light colours should be avoided. The Design Data Sheet on Surface Finishes associated with the Guide to Building and Power Systems Guideline F/ZI/01, recommends the types of finish and reflectance values for SBE surfaces.

The frame abutting the screen should have a dark matt finish. The material of the keys should have a matt finish also.

3.2.2 Construction of Unit

The unit should not have any sharp contours or corners which are liable to cause injury, and the materials used should be of high impact strength.

Access to any operator image adjustments provided should not require the operator to leave the operating position, and be located clear of possible accidental operation.

Access to internal components and adjustments should require the use of special tools to minimise unauthorised adjustment.

3.2.3 The Screen

The screen should be treated so as to minimise the effect of specular reflection from the screen surface. This treatment should not visibly diminish the readability of the displayed information.

3.2.4 Keyboard/Screen Assembly

It is desirable that the keyboard and the screen be separate components. This allows independent positioning of these components to suit particular tasks, and to adjust for differences in body dimensions between operators.

This also will allow the equipment to be placed in the optimum work position and allow selective placement of the screen to avoid screen reflections.

3.2.5 Slope of Screen Face

To make allowances for variations in the seated heights of operators, the VDT should be adjustable so that the angle of the screen to the viewer can be varied. In a comfortable seated posture the neck muscles relax and the head tilts down. The most comfortable line of sight for a seated person is about 38° below the horizontal.

Ideally the screen would be placed at about 38° to vertical to provide optimum reading conditions. However, because of the constraints imposed by the need to provide a satisfactory visual environment, the actual screen angle should preferably be adjustable in the range of $0\text{-}20^{\circ}$ to the vertical, away from the operator.

Indiscriminate placement of the VDT, and excessive display screen angle, may require special lighting treatment and should be avoided wherever possible.

If the VDT can be equipped with a hood to eliminate reflections, the hood should shield the full face of the screen. Partial shielding will lead to distracting differences between the shaded and unshaded portions of the display.

In practice it will be necessary to take considerable care in the positioning of SBE displays to minimise reflections.

Where a single VDT is involved, or the task is of an intermittent nature, the existing office lighting will generally be adequate with selective placement of a suitable VDT.

Where the SBE installation requires groups of VDT's, or where the installation is such that selective placement cannot provide a suitable visual environment, the Buildings Branch should be consulted so that suitable lighting and environmental treatment can be provided, and probable sources of reflection can be isolated to overcome these problems. Sources of reflection such as windows, existing overhead lights, and other high contrast areas may need to be minimised in accordance with the Building & Power System Guidelines.

3.3 Display

The objective of the visual display is to present information clearly. The characters should be snarp, clear and should not exhibit any flicker, shimmer or distortion.

3.3.1 Character Size and Shape

The size and spacing of the character for best visual effect is dependent upon the distance between the operator and the screen.

The shape of characters should be clear and easily differentiated. Character recognition is affected by width to height ratios, intercharacter spacing and the dimensions of the character cell dot matrix. The method of generation should produce a suitably clear and constant colour density character.

The linear characteristics of the system and the spacing between lines should ensure that the operator can readily follow lines across the display.

3.3.2 Screen and Character Colour

There are two important considerations when selecting a colour for SBE:

- ability of the eye to focus on the colour combination at the same distance
- the ability of the display to provide adequate colour contrast.

Under normal lighting conditions the eye is most sensitive to light in the green-yellow part of the spectrum. Therefore, light lettering, e.g. yellow on a darker background, is preferable. For this reason, these colours are often recommended for characters on a dark background. In practice, however, this consideration is secondary to the need for adequate contrast and display clarity for ease of reading. The choice of colour therefore tends to be more subjective.

3.3.3 Screen Refresh Rate and Tube Storage Delay

A characteristic of Cathode Ray Tube displays requires

Unless the persistence of the phosphor coating on the display tube and the refresh rate are well matched, perceptible image "flicker" or "jitter" will result.

The ability to detect flicker, in particular, will vary considerably from person to person especially with age.

The cathode ray tube phosphor should be selected to have a long persistance consistent with not showing smearing of the image when the display is changing.

The refresh rate and display stability should be such that there is no perceptible image flicker, jitter or shimmer.

These phenomena are distracting and accelerate visual fatigue and, therefore, any SBE selected should be tested to demonstrate that these phenomena are not normally perceptible in the display.

3.3.4 Contrast, Focus and Brightness

The brightness of the displayed character compared to the background is a personal choice, and relates to the cellular sensitivity in the eye and the age of the operator.

Ideally, the VDT should be provided with a single control which allows the operator to adjust the character image level.

The focus control permits adjustment of the size of the scanning spot. This adjustment is critical in obtaining a satisfactory size of spot over all parts of the screen, and should only be accessible to technical staff.

The brightness control sets the brightness of the image and the background. This control should normally be set so that the background (raster) is not visible - that is, the characters are displayed on a dark background. This control would normally be preset by technical staff and need not be altered by the operator.

The contrast control adjusts the difference in brightness between the background and the displayed image. With the background set at a dark level - by the brightness control the contrast control should alter the "brightness" of the characters without affecting the background. This control is the only image adjustment required by the operator.

Training in the selection of an acceptable image should be provided for all operators.

3.3.5 Screen Size

The screen size should be as large as practical having in mind that the viewing distance should not exceed 600mm, and that the whole display must be within the field of vision of the operator without requiring any movement of the head.

In practice, screen sizes of up to 400mm, measured diagonally inside the screen mask, are suitable, depending on the task and VDT construction.

The scan method should be such that any distortion of display at the edges is not perceptible to the operator and the display should utilise the majority of the screen area.

3.4 Keyboard

3.4.1 Keyboard Layout

The keyboard layout best suited for one task may not be suitable for another task. For instance, where high volume key stroke operation is required, ergonomic keyboards may be more desirable than the standard QWERTY layout.

However, if a standard keyboard is used, and currently the QWERTY type appears to have "de facto" acceptance as the current standard, there will be increased opportunity for staff performing SBE functions in one area to move to other areas where SBE is used.

3.4.2 Key and Keyboard Profile

Most modern keyboards have concave shaped keys to fit the general shape of the finger tips and therefore provide comfortable operation.

After prolonged use, some key surfaces develop a glossy surface. To reduce this effect surfaces should have a matt finish. Double shot moulded replaceable keytops are preferred.

Keyboards separate from the display should be selected and the front edge of the keyboard should be as thin as possible.

The thickness of the keyboard at the home row of keys and the thickness of the table top are critical factors in ergonomic work place design. See Section 4 for a detailed description. The thickness of the Keyboard to the home row of keys should not exceed approximately 30mm. Often in practice some front edges exceed, 40 to 50mm in thickness which causes undesirable wrist extension and loading of the hands. In some cases the relatively sharp edge can cause pressure points on the wrists.

To enable good posture to be obtained, reducing the static loading of the arms, keyboards thicker than 30mm should be avoided, unless adequate wrist support is provided. In these cases a wrist rest should be integrated with the keyboard, or provided as an additional fitting.

The design of wrist rests varies with the characteristics of the keyboard, consequently no single wrist rest design can be recommended. However where a wrist rest is needed it should have the following characteristics:

1. It should be manufactured out of a material having a low heat conductivity, e.g. wood or plastic.

2. Its surface should be matt and smooth with no sharp edges or protrusions which may place unnecessary pressure points on the hands or wrists.

3. It should be designed to match the height of the leading edge of the keyboard and should extend the full width of the keyboard.

4. Its depth should not be so great as to interfere with the forearms yet should be deep enough to provide adequate freedom of movement of the hands at the same time providing support over the surface of the hypothenar emminance on the palm of the hand.

Minimum wrist extension and hand loading seems to be achieved with the keyboard profile set at an angle between 5^{0} and 15^{0} from the horizontal.

3.4.3 Key Size

Generally a square shaped key is preferred because it provides a larger target area than the older circular shape. A recommended size is 12 to 15mm square.

3.4.4 Colour Coding of Keys

Function keys which are not part of the main alphanumeric set are more easily located if they are distinguished by colour coding. The colour of keys should be selected to minimise possible reflections in the screen.

3.4.5 Key Stroke, Travel, Force and Feedback

Feedback in key operation is an important factor in the operator/keyboard interface. The absence of feedback, visual, tactile or audible, can contribute to slower keying speeds and inaccuracies. Preferably a combination of tactile, visual or audible feedback should be available.

Care should be exercised to ensure that the noise levels associated with audible feedback do not become a dominant influence in the audible environment.

Keystroke should be positive and preferably provide tactile feedback at the end of the stroke.

The force required to operate a key should be relatively light but should be commensurate with positive action and tactile feedback.

3.5 Safety

SBE requires relatively high voltages for their operation. These voltages can be hazardous if the protective cover is removed. A notice should be attached to the SBE, preferably near the cover fixing screws, indicating that only qualified persons should remove the cover because of the hazards of high voltages.

Cathode ray tubes because of their high vacuum can under extreme circumstances be subject to implosion. They therefore should be fitted with protective devices such as laminated screens which act as implosion shields.

3.6 Radiation Standards

Extensive measurements of ionising and non-ionising radiation emitted by cathode ray VDTs, both by Australian and overseas organisations have shown very low, sometimes immeasurably low, levels of radiation well within safety standards.

The following limits are based on the presently available scientific data and protect against biological effects, both thermal and non-thermal, resulting from the deposition of radiation energy in tissue. The limits stated for operation of VDT are five to ten times below the occupational maximum exposure limits, to protect against any biological effects, not only potentially hazardous effects.

The levels of radiation emitted from cathode ray VDTs shall be as low as possible, and should not, at any time, exceed the following limits:

1. Non-ionising radiation - radiofrequency part of the electromagnetic spectrum

   i. 50 Hz to 0.3MHz - until an Australian limit is developed for ELF emissions from VDTs radiation shall be limited so that the electric field does not exceed 50 V/m, measured 30 cm from the terminal.

   ii. 0.3 - 300 000 MHz - exposure to VDT operators shall not exceed 0.1 mW/cm^2 averaged over 24 hours and within any one minute period.

   iii. All other frequencies (visible, infrared & UV spectrum) - radiation shall not exceed the limits defined by the American Conference of Governmental Industrial Hygienists (ACGIH).

2. Ionising radiation - National Health and Medical Research Council (NH & MRC) standards for all ionising radiation.

   The measurement of radiation emission levels shall be a part of an annual maintenance inspection of the terminal.

   All measurements shall be conducted with a suitable range of instruments of sufficient sensitivity to establish compliance with these limits.

In the event of component failure in the display generation system, the terminal shall be immediately removed from service, and radiation emission levels checked before replacement in service.

Safeguards must be provided to prevent operation of the cathode ray tube should component failure create conditions which might cause unduly high levels of radiation.

SECTION 4 - WORKPLACE LAYOUT AND POSTURE

4.1 Terminal Function Types

Computer terminal work stations pose problems of layout which are not encountered in the conventional desk and hard copy situation. Design is made complex because of the nature of terminal operation which can fall into the three basic categories described in Section 1.

All three functions require differences in ergonomic treatment in work station layout because of the differences in operation.

As a guide, the workplace design should be treated as follows:

CATEGORY	TREATMENT
A1	All of the ergonomic requirements of these Guidelines are to be met, being critical to safe operation.
A2	All of the ergonomic requirements of these Guidelines are to be met, being critical to safe operation.
B1	All of the ergonomic requirements of these Guidelines are to be met, being critical to safe operation.
B2	Ergonomic requirements are critical at high usage rates, important at low usage rates.
B3	Ergonomic requirements are important.
C2	Ergonomic requirements are important.
C3	Ergonomic requirements are important.

4.2 Workplace Layout

With careful planning of the workplace many of the problems which are encountered with SBE working can be overcome. Layout of equipment and furniture should promote an environment in which good seated posture can be attained, and in which there are minimum causes of bodily fatigue within the constraints of the equipment and furniture.

To operate a keyboard and read from the display screen typically requires movement of the head in an arc from the keyboard to screen. Whilst movement at the workplace is generally recognised as being healthy, prolonged neck flexion and static loading of arms can lead to discomfort in the neck and shoulder muscles.

The screen and keyboard should be placed in such positions as to minimise the above effects. The major factors affecting optimum location are :

- viewing distance to screen and keyboard;
- work height and seated posture;
- angle of declination of the head; and
- screen angle.

4.2.1 Viewing Distance

The normal reading distance for most people is between 400-100Cmm. A preliminary analysis would suggest that the screen and keyboard should both be placed within this range to minimise refocusing. The location of the display, keyboard, document holders and writing surfaces should allow operator adjustment within this viewing range.

4.2.2 Seated Posture

The basic aims of well designed seating should be to lessen fatigue, allow changes in seated posture, and to promote good seated posture. The main features of good seated posture, shown in Figure 4-1, are summarised below:

- the chair seat height should be adjusted so that the thighs are supported mainly by the lower legs;
- the weight of the trunk should be supported mainly by the buttocks with minimum compression of the thighs against the chair seat;
- where the arms are bent to perform work, the angle formed between the upper and lower arms should be about 90° or slightly greater;
- during the nonkeying periods the wrists should be adequately supported by a wrist rest or the arms supported on arm rests;
- the angle formed between the trunk and the thighs should ideally be between 80° and 100°;
- the lumbar spine should be supported adequately by the chair back support; and
- the feet should have adequate support on a flat surface.

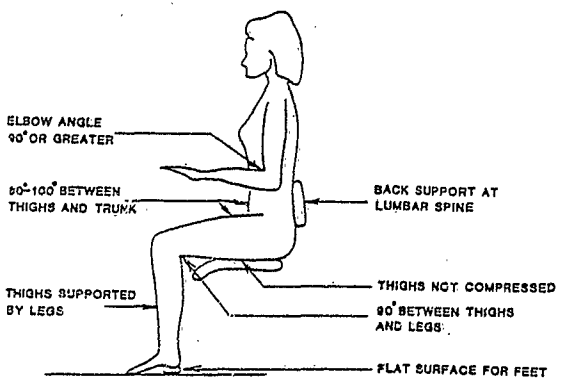

Figure 4.1 - Features of Good Seated Posture.

4.2.3 Working Heights

Variations in working heights affect the seated height of the operator over the range from the smaller female to the larger male.

Shown in Figure 4.2 are a small female and a large male seated at a working height of 750mm which has been used as an example, ie table height of 720mm with a keyboard thickness of 30mm.

This shows that chairs and tables should be adjustable in order to suit operators in the range of the 2.5 percentile female and the 97.5 percentile male.

The workstation surface should be adjustable in height from 600mm to 730mm above floor level.

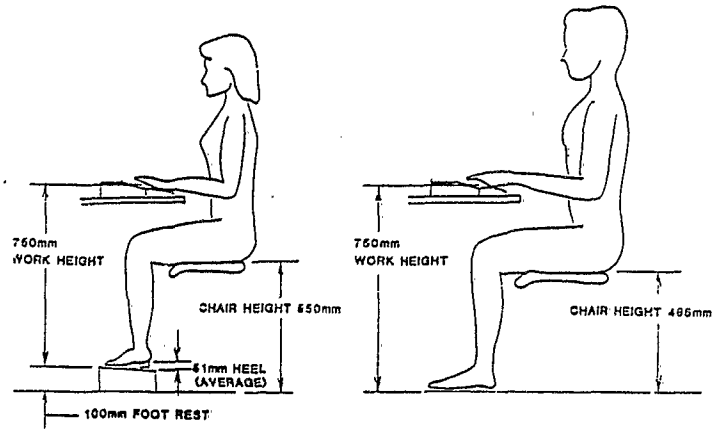

Figure 4.2 - An Example of the Implications for Operators of Different Body Dimensions Sitting at the Same Work Height (750mm From Floor Level).

The optimum working heights are shown below :

Smaller Females	680mm
Larger Males	710mm
Both	710mm

Where the keyboard and table top exceed 60mm it may be necessary to increase the above heights to allow for sufficient thigh clearance.

4.3 Practical Design of SBE Workplaces

Sound ergonomic design takes all relevant criteria into consideration and most times it is achieved as a result of compromise caused by a number of limiting factors, for example:

- keyboard thickness, which can limit thigh clearance, and may cause some elevation of the lower arms.
- fixed workstation height which can affect seated posture;
- visual display unit screen height and angle which may affect viewing angles;
- variations in body dimensions of operators;
- variations in eyesight.

Therefore some features of work posture may depart from the ideal especially for the taller and smaller operators, for example:

- forearms flexed marginally less than 90° to the upper arms;
- trunk leant slightly forward or backward (but still firmly supported at the lower spine);
- chair adjusted to suit work height but 20-30mm either too high or too low with respect to floor level;
- marginal head movements when changing viewing angle from keyboard to screen;
- viewing distances between 350 to 700mm.

Provided that departures from the ergonomic ideal are minimised the final design of SBE workplaces will still provide a safe and healthy place to work.

SECTION 5 - WORKPLACE FURNITURE AND EQUIPMENT

5.1 Introduction

The selection and correct use of furniture is important if a desirable posture is to be obtained. This was discussed in detail in Section 4. In the selection of furniture some of the important considerations are:

- chair design;
- working height, which is the height of the keyboard, or other equipment to be operated from the floor level;
- table height;
- table top thickness;
- provision of footrests for the smaller operator;
- provision of document holder.

Technical specifications on furniture and layout for SBE workstations can be obtained from Building and Power Systems Guidelines, F/Zi/01, A/Ke/01, F/Zi/02 and P/Cf/01.

5.2 Chairs

Because of the nature of a SBE operator's work and the relatively long periods of sitting, it is desirable that chair design be conducive to good posture. In general, this implies a steady, well proportioned chair with good lumbar back rest support and not overpadded.

The Serial 16 chair, to Drawing 3BC-3177, is recognised by Telecom as being suitable to meet the needs for good seated posture for SBE operators who work for continuous periods. It will be provided as the standard chair for SBE operators.

A report on the design of the Serial 16 chair has been prepared by the Engineering Department and is available from Manager, Buildings Sub-division in Headquarters.

This report includes the necessary specification data to select a satisfactory chair for SBE operators.

5.2.1 Chair Seat

To accommodate the smaller person the chair seat should be no longer than 400mm. Padding needs to be of sufficient thickness so that the seat is not uncomfortable; but it should not be so thick as to discourage movement or should not cause localised pressure areas under the thighs.

The curved or waterfall shaped front edge presently favoured in certain designs, may not be necessary if the chair seat is the correct length i.e. 400mm.

5.2.2 Chair Back Support

The general shape of the back support should be concave to fit the general contour of the lumbar spine area. To support the lumbar area adequately, it should be approximately 200mm wide. Non-adjustable back supports should be approximately 200mm from the centre to the top of the chair seat.

5.2.3 Arm Rests

Arm rests should be optional as their need is task dependent. For continuous keying tasks they are undesirable. Where keying is somewhat less than continuous, arm rests can be provided. Arm rests should provide a comfortable rest without causing localised pressure areas on the arms.

5.2.4 Chair Base and Castors

The chair seat support should be of a swivel type allowing free rotation of the body. The base should have five points for stability. Where chairs are to be used on carpets the base should be fitted with castors of the two wheel type which will provide sufficient friction for stability and allow free movement of the chair. On low friction floors, e.g. vinyl, glides should be used for stability instead of castors.

5.2.5 Chair Upholstery

Back rest and seat upholstery should be hard wearing, easy to clean and provide sufficient friction and yet allow changes in posture. The material should be of a breathing type in order to prevent discomfort caused by the generation of heat and moisture.

Where cloth upholstery is provided it should be a mixture of approximately 60% wool and 40% of another fibre. Washable cloth seat covers will normally be provided, and be laundered at Telecom's expense.

5.2.6 Chair Maintenance

Regular preventative maintenance checks should be carried out in all work areas, so that the chairs continue to perform satisfactorily.

5.3 Workstation Design

In the design of the workstation, table dimensions and work height are important factors in attainment of desirable working posture. Consideration of table height to set the work at the required height is most important. Another critical factor, as shown in Section 4.2.3 is thigh clearance.

5.3.1 Workstation Top

It is desirable that the table top thickness should not exceed 30mm. This allows the larger male to work at a keyboard height of approximately 40mm above the table top and still have sufficient thigh clearance. The surface should be of a matt finish to reduce specular glare.

There should be a conveniently located space provided for the storage of personal belongings if not provided by separate accessible locker facilities.

5.3.2 Workstation Height

To accommodate the larger male the maximum table height should give adequate thigh clearance by providing a clearance of at least 680mm to the underside.

5.3.3 Workstation Design Safety

In the construction of the table there should not be sharp corners or edges so that possible injuries from bumping into or grazing against are avoided.

The underneath edges and corners of the workstation which could come into close contact with the seated worker's thighs, legs and feet should be of a finish that will prevent possible injury or discomfort.

5.3.4 Workstation Adjustability

The height of the table should be adjustable only when the position is permanently staffed by shift rotation, and several different operators use the table and the SBE is operated for more than 25% of the day. (Categories A1, A2, B1, B2) Developments in workstation design which will allow for greater operator adjustability are being kept under review.

5.4 Footrests

Where no height adjustment of the workstation is provided, the shorter worker should be provided with a footrest to enable them to adopt an acceptable working posture at fixed working heights and to remove pressure from the underside of the thighs. The footrest should be large enough to place the feet comfortably and allow changes in posture, but not cause undue problems for storage when not required.

5.5 Document Holders and Their Use

Document holders are desirable for use with SBE operation to avoid postures of the neck which are conducive to premature fatigue. They enable the source documents to be placed in the most comfortable position for the operator from both postural and visual points of view. Depending on the nature of the SBE task the operator will look at the source documents or the screen for the majority of the time. If the source documents are viewed the most, they should be placed directly in front of the operator, preferably on a suitable document holder placed behind the keyboard. On the other hand if the screen forms the major part of the visual task, it should be placed in front of the operator and the documents off to one side.

Where both screen and documents are viewed concurrently both documents and screen should be within the visual field so that a minimum of eye movement either laterally or vertically is performed by the operator.

The design of document holders varies with the characteristics of the tasks so a general document holder design for all SBE is not practical. However, where document holders are to be used, they should exhibit the following characteristics.

1. The surface should be of a matt finish to avoid reflections and be large enough to accommodate the size of documents being used.

2. A row marker should be provided where source information is congested or difficult to identify.

3. A clip or other securing device should be provided to hold the documents in place.

4. Where possible the tilt of the holder should correspond to the angle of the screen. However in cases where the documents are constantly in the visual field, an angle of 20^{0} backward tilt is recommended.

5. For special cases where the use of documents is highly repetitive e.g. processing cheques, receipts, etc., a special document holder may be required. Information about these special cases can be obtained from the sources in Section 1.5.

SECTION 6 - ENVIRONMENT

Working environment is an important and personal issue to each employee.

The policy defining the appropriate scope and scale of provision of accommodation for SBE operator areas is set out in Guide to Building and Power Systems Guideline P/Cf/01.

The general design principles involved are included in a further series of these Guidelines. These functional guidelines begin with F/Zi/01 which sets out general design requirements at the system planning stage.

Copies of these Guidelines are readily available from State and Headquarters Building Branches.

The following aspects affecting environmental conditions are considered in detail in these Building Guidelines.

6.1 Lighting

It is Telecom's aim to provide a total facility including the provision of lighting which will be compatible with the particular SBE task, in order to provide optimum capability for reading display screens and also to provide long term visual comfort. The aim of lighting design in these areas therefore, should be the effective combination of natural and artificial light sources.

6.2 Visual Fields

The visual field to be considered should comprise the following elements:

a. The visual task.

b. The task background.

c. The immediate surroundings - desk tops, screen enclosure, adjacent walls or furniture etc.

d. Visual environment - room surfaces and more distant furniture.

The total lighting installation, should be designed, as far as possible, for maximum operator comfort and visual efficiency. This will be guided by recommendations given in various authoritative lighting publications and established lighting codes, including, Australian Standard AS1680 "Interior Lighting and the Visual Environment".

6.3 Ambient Lighting Levels

Illumination requirements for SBE depart from the approach normally applied to conventional office lighting. There are cases where special techniques may need to be applied in order to illuminate normal reading and writing tasks without influencing the screen task. The assistance of qualified Buildings Branch staff should be sought in these instances, immediately the problem is recognised.

6.4 Reflections

All of the lighting elements-windows and artificial light sources, should preferably be sited or controlled in such a way as to avoid the occurrence of veiling reflections in display screens, which would inhibit readability. Buildings Guideline F/Zi/01 provides the necessary information to deal with this problem.

Various parameters of SBE screen performance (eg character brightness, contrast, character size and configuration, colour, background brightness, distance and angle of screen) should be taken into consideration, in order to achieve operator satisfaction with regard to acceptable visual performance.

6.5 Environmental Conditions

The environmental conditions within SBE operating areas should be controlled to ensure that the temperature, humidity and air cleanliness in the area are satisfactory for operator comfort, as well as meeting operating requirements for the equipment.

In grouped installations, the additional heat load generated by the terminals and associated equipment must be taken into account by the Buildings Branch in assessing the adequacy of existing environmental control plant.

Single terminals should not generate sufficient heat to require additional cooling, but reference should be made to Buildings Branch where more than 3 terminals are installed in the one airconditioning zone (usually an office building floor).

Single terminals may be installed in buildings which are not airconditioned, in areas which already provide comfortable conditions for staff.

Where airconditioning is installed, the range of temperatures provided within the area depends on the geographic location within Australia, and the time of the year.

Generally, the temperature for comfortable operation is in the range of 20-23^{o}C "effective temperature". "Effective Temperature" takes into account dry-bulb temperature, relative humidity and the rate of air movement in the conditioned space.

To establish these conditions:

- temperatures may vary between 18^{o}C and 25^{o}C
- relative humidity may vary between 45% and 70%
- air movement in the order of 6-10 metres per minute is required.

Where air treatment plant is provided to condition the occupied space, the ventilation plant will be equipped with air filtration. The standard of this filtration equipment shall be in accordance with Guide to Building & Power Systems, 2P0002, Air Filtration Requirements for Telecommunication Buildings, to ensure adequate air cleanliness.

These conditions are described in more detail in the Guide to Building & Power Systems, Air Treatment for Staff Comfort, 1P 0001.

6.6 Noise

SBE are basically quiet but associated hard copy printers etc may generate noise. The noise emitted from SBE and associated printers should be at a level that does not add significantly to the general background noise of the area.

Effort should be applied to ensure that equipment noise is controlled in operator areas by the use of selected sound absorbing materials to achieve an acceptable acoustical working environment.

6.7 Decor and Building Finishes

The Guideline F/Zi/01 details the recommended treatment for the surfaces of floors, walls and ceilings in SBE operator areas.

Office screens that are above the eye level for a seated person may be used to divide up larger areas or groups. Potted plants should be provided on a moderate scale and are part of visual relief areas. Consultation with representatives of the Operations Group and relevant Unions should take place during the planning and implementation of interior schemes.

6.8 Safety

6.8.1 Cables leading from the SBE to the power source should be concealed so that they do not create a tripping hazard.

6.8.2 Electrical appliance safety testing should be arranged at normal intervals. Unsafe equipment should be disconnected until tests and repairs are completed.

6.8.3 Passageways should be kept clear of obstructions. Fire escapes should be clearly marked and should be kept free of any obstacles. Exits should be clearly marked and lit.

6.8.4 Fire alarm systems and fire fighting equipment appropriate to the premises should be provided. The Senior Fire Safety Officer, Buildings Branch will provide information on the types of extinguishers to be provided. Evacuation drills should be conducted regularly.

SECTION 7 - WORK ORGANISATION

SBE operation differs significantly from the traditional hard copy task in that the operator, instead of reading black writing on white paper on a horizontal plane, is required to read an illuminated display on a plane which is usually around the vertical.

With normal paperwork staff can move the information about the desk or pick it up to read it thus adopting many postures during the working day and reducing the possibility of muscular fatigue.

However, SBE's are difficult to move about because of their size and weight and this results in the operator adopting a particular posture for long periods whilst operating the equipment. This is especially so where few facilities for equipment adjustment are available. A person who is required to maintain a particular working posture for long periods may develop problems of muscular fatigue and loss of concentration.

Earlier in these Guidelines mention was made of the considerations that need to be paid to the ergonomics of the equipment and furniture, as this will allow operator adjustment and thus reduce the problem of fatigue. Mention was also made of the considerations needed to achieve an acceptable visual environment.

In addition to these considerations, there is also a need to examine the work organisation of the task to be performed, particularly the need for work breaks.

Where the operator undertakes other activities apart from the operation of the SBE then the consequences of minor inadequacies in the ergonomics of the equipment or furniture are reduced.

On the other hand, if the task requires continuous operation of the SBE the ergonomic considerations then become important to avoid operator fatigue.

Ergonomists in Europe, who have studied the question of work breaks in SBE environments, have no firm recommendations concerning when work breaks are needed, how long they should be, etc. The recommendations they have made, however, are related to what operators ought to do during a break, after they have been considered necessary.

The most beneficial effects to an operator are not achieved by just stopping work; they are achieved by exercising those muscles (neck, eye, shoulders, arms and buttocks) which are being statically loaded or have restricted movement. Telecom will take the following action in relation to work organisation:

(i) Operators will be allowed and encouraged to move and exercise the static parts of their bodies and to rest their eyes and active parts of their bodies frequently during the working day.

(ii) Attention should be paid to organising the task so that where possible the requirement for staff to operate SBE will be interspersed with other duties that require movement away from SBE.

(iii) Where it is not possible to intersperse SBE operation with other tasks and long periods of repetitive keyboard activity are involved, local management will arrange for the following action as appropriate:

Category 1 Operation (Continuous)

(a) the provision of up to 4 work breaks of up to 10 minutes duration in addition to normal lunch and tea breaks; or

(b) a working day divided into a number of sessions none of which exceed 1½ hours duration; or

(c) a combination of (a) & (b).

Category 2 Operation (Part-time)

(a) the provision of up to 2 workbreaks of up to 10 minutes duration in addition to normal meal and teabreaks.

Note: Re-arrangement of normal meal and teabreaks may be necessary.

No statutory period of work break has been determined as the length of break and frequency depend on a number of factors including the task, the equipment and the environment. However to illustrate the application of (iii)(a) above to standard working hours the following example is provided as a guide only:

Example of Work Breaks Applied to Standard Hours (Continuous SBE Operations)

8.30 am start ← WB → 10.00-10.15 MT ← WB → 12.00-12.45 lunch
12.45 ← WB → 3.00- 3.15 AT ← WB → 4.36 pm finish

Telecom is currently undertaking a pilot study of the effectiveness of exercise programs in preventing the occurrence of discomfort and injury arising from SBE operation.

SECTION 8 - EDUCATION

With the introduction of any new or different work methods a period of education is required to allow the operators and their supervisor to become familiar with the characteristics of the job. A training program for SBE operators and their supervisors should contain two modules on SBE operation:

1. Functional operating procedures

   Learning Aims: Operators should be able to follow the required functional operating procedures including keyboard operations, coding instructions and computer commands.

2. Health aspects of workplace layout

   Learning Aims: Operators should be able to arrange their workplace and adopt a healthy working posture to minimise postural strain and eye fatigue. A health education module comprising audio visual taped slide presentations and brochures are available from the Occupational Health Service - Tel (03) 606 7263.

SECTION 9 - EYESIGHT EXAMINATIONS

9.1 Introduction

All staff who will be required to operate SBE on a regular basis (i.e. in excess of 25% of their working day, or Category 1 and 2 operators) will be given eyesight screening tests prior to commencing work on SBE and thereafter every two years whilst they continue to operate SBE.

For the next six years, eyesight screening tests will be conducted in accordance with the procedures detailed in 9.2 and 9.3 below. After 6 years however, these procedures will be reviewed and may be amended in the light of scientific evidence then available as to the need for eyesight testing of SBE operators. During this time both Telecom and the staff organisations have agreed to aid mutually acceptable scientific studies.

9.2 Eyesight Testing Arrangements

Telecom will arrange eyesight screening tests for all regular users of SBE as follows:

- New appointees

  As part of the normal commencement medical examination, prospective new appointees will have their eyesight tested by the Australian Government Medical Officer, or his delegate, to determine whether their eyesight is satisfactory for the purpose of operating SBE. No further examination is required providing they commence operating SBE on a regular basis immediately after appointment. Prospective new appointees will be required to pay the cost of any spectacles which may be deemed necessary as a pre-requisite to their being offered permanent appointment.

- Existing staff commencing work on SBE for the first time.

  Existing staff who are required to commence operating SBE on a regular basis will be given the appropriate eyesight screening test upon commencement of their new duties.

- Staff already employed on SBE.

  Staff who are currently operating SBE on a regular basis and have not yet had any eyesight screening test, will be given the appropriate eyesight screening test as soon as practicable.

- Re-Testing

  All staff who are required to operate SBE on a regular basis will be given the same eyesight screening test every 2 years for so long as they continue to operate SBE on a regular basis. Additional re-testing will be provided on request whenever symptoms indicate that a problem may exist.

9.3 Conduct of the Tests

The appropriate eyesight screening test consists of the following ocular tests:

1. Distance Visual Acuity
2. Near Visual Acuity
3. Oculamotor Co-ordination
4. Colour Vision
5. Slit Lamp Examination of the Eye
6. Ophthalmoscopic Examination of the Ocular Fundus.

Tests 1 to 4 may be administered by Occupational Health Nurses but tests 5 and 6 can be performed only by an ophthalmic practitioner.

In general, the tests will be performed by Telecom Occupational Health Nurses and Telecom consultant ophthalmic practitioners and where this is not practical, wholly by ophthalmic practitioners. The cost of all eyesight screening tests will be borne by Telecom.

Visual defects revealed by the eyesight screening tests may not necessarily mean that staff are visually unsuited for SBE operations. In most cases, the defective vision may be corrected by properly prescribed spectacles. Telecom will pay the cost of any prescription spectacles, including a standard frame, deemed to be necessary for staff employed on SBE provided such spectacles are prescribed and provided by the Telecom consultant ophthalmic practitioner.

Staff may choose other than standard frames but Telecom will not be responsible for any additional costs incurred.

The prescribed correction will be specific to the task of operating SBE.

Alternatively, staff may elect to consult an ophthalmic practitioner of their own choosing for the purpose of obtaining any prescription spectacles deemed necessary by the Telecom consultant ophthalmic practitioner. In such cases Telecom will not be responsible for the additional costs incurred but will reimburse the cost of prescription spectacles up to the amount which would have been charged by Telecom's consultant ophthalmic practitioner.

9.4 Test Records

All records of eyesight testing and correction will be held confidentially by Telecom medical staff and/or Telecom's consultant ophthalmic practitioner, but will be made available to the employee concerned if requested. Telecom may also use the test records to assist any scientific study it may wish to undertake or participate in.

ATTACHMENT 1 - TENDER SPECIFICATION - ERGONOMIC ASPECTS

Future Telecom Tender Specifications for the supply and delivery of cathode ray tube SBE and associated keyboards will include the ergonomic aspects of SBE operation.

The following lists those areas which should be included in all future tender specifications along with the technical requirements for the equipment. Telecom Specification 1433, Visual Display Terminals provides these technical requirements, and the specific reference is shown in brackets.

ERGONOMIC REQUIREMENTS

1. GENERAL

This section specifies Telecom Australia's requirements for the ergonomic characteristics of cathode ray tube visual display terminals and associated keyboards.

The ergonomic characteristics of the visual display terminal and keyboard are specified in this section to satisfy human requirements relating to the area of:

- Vision
- Noise
- Operator/Equipment Interface
- Psychology

2. VISION

i. Appearance: the cabinet, keyboard, keys and any other associated equipment shall be of a matt finish to suppress glare or specular light. Pastel or neutral colours are preferred. Because of its high reflective characteristics white should be avoided. (6.13)

ii. Contrast, Focus and Brightness: controls in all three are required, however, it is preferable that the brightness and focus controls be at the back of the visual display terminal. These shall be preset but readily capable of being adjusted by qualified personnel. (6.3)

A contrast control for operator use, however, is necessary and shall be located at a position readily accessible to the operator when seated in the normal operating position. (6.3)

iii. Screen and Character Colour: the colour of the display shall be light characters on a dark screen background. Fluctuations in the brightness of the characters shall not be perceptable. (4.1)

iv. Character size and shape: character size shall be as large as practicable and the shape of characters shall be clear and easily differentiated. (5.2)

v. Character generation: the generation method shall produce a clear, constant colour density character. Horizontal and vertical strokes shall have generally constant intensity. (5.2 - 5.8)

vi. Format: linear characteristics of the system shall be such that visual tracking is not impaired to a point where tracking must be assisted. Also line separation shall be sufficient to prevent incorrect tracking. (3.2)

vii. Screen Size: screen sizes in the range 300mm to 400mm, measured diagonally inside the screen mask are desirable. (4.8)

3. NOISE

i. Equipment Noise: Telecom Australia prefers that ambient noise levels shall be as low as practicable so that the equipment will not add significantly to acceptable ambient noise levels of the environment in which it is to be placed. (6.11)

ii. Key Operating Noise: Audible indication of positive keystroke can be provided in addition to tactile or visual indication. However, the audible click shall not significantly add to the noise level. (5.3)

4. OPERATOR/EQUIPMENT INTERFACE

The elements specified under this subsection relate directly to the interaction between the operator and equipment.

i. Construction: materials shall be of high impact strength and the unit shall not have any sharp contours or corners which are liable to cause injury. Access to internal components and adjustments shall require the use of special tools to minimise unauthorised use. (6.14, 6.16, 6.17, 6.19)

ii. Assembly: keyboard and screen shall be separate components to permit flexibility of their location. The thickness of the keyboard shall be minimised. (6.13, 5.5)

The keyboard shall be skirted at both ends and the side facing the operator by a flat area integrated with the keyboard suitable for use as a wrist support. The height of the bottom of the surround on the screen face shall not be lower than the height of the back of the keyboard. The front of the wrist support shall recede to level with the surface of the position table.

iii. Keyboard Layout: the key layout on the alphanumeric keyboard shall conform to the standard scholes ("QWERTY") layout. Special function keys shall be separate from alpha keys and colour coded. The colour of the keys shall not be such that distracting reflections may occur in the screen. (5.1)

iv. Slope of Screen Face: the visual display unit shall be constructed to enable the slope of the screen face to be adjusted by the operator seated in front of the screen. The angle of the screen face shall preferably be adjustable within the range 0^{o} to -20^{o} measured from the vertical. (6.5)

v. Key operating pressure: dynamic loading shall be sufficient to prevent key "bounce" and consequent double keying. However, keys should not induce undue fatigue by excess pressure or movement.

vi. Key action: keys shall have positive movement, and an indication of positive operation (Refer to 5 below). (5.5)

vii. Radiation Emission: Radiation emission shall be as low as possible, and shall not exceed the limits described in Section 3.6 of this Guideline.

5. PSYCHOLOGICAL

This section relates to the psychological perception and motor learning problems associated with the operation of SBE.

i. Touch: keys shall be positive in action, giving a definite feedback indication of transmission. This can be auditory or tractile, however, the latter is preferred. (5.3)

ii. Keys: keys shall be concave, giving definitive location for fingers. Also symbols shall be recessed and wear resistant. Double shot moulding is preferred. Key size and spread shall allow for positive location without tactile interference during keystrokes. (5.6)

iii. Keyboard: there shall be a clear separation between alpha keys and remaining keys and the overall number of keys on the keyboard shall be minimised. (5.1)

iv. Feedback: dependent upon operation function, positive visual feedback of keystrokes on the screen is desirable. Confirmation of correct input action is necessary. (5.3)

v. Function Keys: shall be separated from standard layout, and be colour coded. Where touch typing is anticipated, light/dark differentiation is preferred since peripheral vision tends to be used and colours may not be discernible. (5.1)

vi. Other keys or controls: shall be located where they can be reached from a normal operating position.

ATTACHMENT 2 - GLOSSARY OF TERMS

Alpha/numeric	Relates to a set of characters which are both letters and numbers.
Anthropometrics	The measurements of the physical features of the human body.
Auditory feed back	Transmission of information to the brain via the sense of hearing e.g., indication of a completed keystroke by the sound of a click.
Back Support Rake	The total angular displacement of the back support of an adjustable chair away from the vertical.
Character	A number, letter or symbol displayed on a visual display screen.
Cursor	An indicator on a visual display screen which identifies the position of character spaces which will be affected by functional command or action.
Dot matrix characters	A character on a display screen formed by small dots within a matrix of dot positions.
Ergonomics	Is the scientific study of the relationship between man and his work environment. It makes best use of man's capabilities and limitations for the design of his work method and the environment in which he works.
Hard copy	Printed matter.
Home row of keys	The centre row of keys at which a typist begins work, e.g., the row of keys commencing ASDFG on the standard QWERTY layout.
Ionising radiation	The emission by atomic nuclei of very fast atomic particles or rays which interact with gases, liquids or solids to produce electrically charged atoms or molecules, known as ions, within the substance.
Key force	The downward force between two consecutive key centres adjacent to each other.
Key profile	View of the key from the side showing the edge outline of the key.
Key stroke	The displacement of the key from its rest position to its fully depressed position.
Non-ionising radiation	Similar to ionising radiation except exposure to non-ionising radiation does not create ions.
Oculomotor ordination	The ability of the eyes to perform co-ordinated Co-movement.
Phosphorescent image	An image generated on a coating of luminous material which emits visible light when struck by a beam of electrons within an evacuated tube.

Raster	The pattern of scan lines traced across the face of the CRT by the electron beam.
Refresh Rate	The frequency with which an image on the face of a screen is regenerated.
Specular light	Light reflected from a mirror like surface.
Tactile feed back	Transmission of information to the brain via the sense of touch e.g., indication of a correct keystroke by feel.
Viewing angle	The angle between the horizonal plane and a line running perpendicular to the surface of the lens of the eye.
Visual acuity	Degree of image clarity obtained by the eye.
Visual Feedback	Transmission of information to the brain via the eyes e.g., viewing information on a CRT.

ATTACHMENT 3 - REFERENCES

Australian Radiation Laboratory, - "The Video Display Unit and X-radiation". ARL Information Bulletin No 1, 1978.

Bailey, I. - "The Ageing Eye". The University of Melbourne.

Birnbaum, R. - "Health Hazards of Visual Display Units". A Review Prepared for the Information and Advisory Service, TUC Centenary Institute of Occupational Health London School of Hygiene and Tropical Medicine, 1978.

Cakir, A., Hart, D., and Stewart, T. - "The VDT Manual", John Wiley and Sons London. 1979.

Cole, B.L. - "Visual Problems Associated with VDUs. Ergonomics and Visual Display Units". Proceedings of a Conference. B. McPhee. A. Howie (Eds) Ergonomics Society of Australia and New Zealand. 1980.

Diffrient, Tilley and Bardagjy, "Human Scale 1.2.3" MIT Press. Cambridge, Mass. 1974.

Dreyfuss, H. - "The Measure of Man". 2nd ed. Whitney Library of Design. New York. 1967.

Industrial Engineering, Telecom Australia Headquarters. "Ergonomic Assessment of the Serial 16 Chair". Melbourne. 1980.

Industrial Engineering, Telecom Australia Headquarters. "Information Paper - Optimal Dimensions". Melbourne. 1980.

Murray, W.E., Moss, C.E., Parr, W.H., Cox, C. "A Radiation and Industrial Hygiene Survey of Visual Display Units ". Human Factors, Vol 23, No 4, 1981 pp413-420.

National Health and Medical Research Council, "Occupational Health Guide - Visual Display Units". NH&MRC, June 1982.

Roy, C.R., Joyner, K.H., Gies, H.P., Bangay, M.J., Cornelius, W.A. "Measurement of Electro-magnetic Radiation Emitted From Visual Display Terminals (VDTs)". Aust Radiation Laboratory Publication ARL/TR053, ISSN 0157-1400, March 1983.

Standards Association of Australia. "AS2466-1981, of Microform Workstations". SAA 1981.

Commonwealth Department of Science and Technology, Physical Working Environment Branch., "VDUs at Work", Aust Govt Publishing Service, Canberra 1981.

STAFF ASSOCIATION REQUIREMENTS

SCREEN-BASED EQUIPMENT

POLICY

FEBRUARY, 1983

A. C. O. A.

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PART ONE - INTRODUCTION

1. The operation of screen-based equipment raises significant implications for occupational safety and health and ergonomics in the workplace. These implications have been largely ignored by management, and, as the utilisation of screen based equipment accelerates - involving more workers and affecting more workplaces - the need for the union movement to develop strategies and solutions to current and future hazards becomes imperative.

2. ACOA policies in relation to the use of screen-based equipment are framed in a preventive rather than a remedial sense in line with accepted principles of occupational safety and health and ergonomics. They are designed to ensure that the well-being of members in not put at risk by management's introduction of technological change. The policies are based on the considerable and convincing body of relevant research material from Australia and overseas, including the factual experiences of members using screen based equipment. Unwillingness on the part of management to adequately address these issues as part of agreed consultative processes on technological change has been, in the Association's experience, amply demonstrated.

3. The enforcement of screen based equipment standards is a matter requiring immediate action, however, there is also a long-term perspective to be considered. The Association recognises the need for the ongoing monitoring of research relating to screen-based equipment use and consequently insists that standards must be constantly reviewed in the light of such developments.

PART TWO - DEFINITIONS

1. OCCUPATIONAL SAFETY AND HEALTH

The following definition is considered by ACOA to appropriately reflect modern concepts of occupational safety and health.

" Occupational Health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by the working conditions; the protection of workers in their employment from risks resulting from factors adverse to health."

2. SCREEN BASED EQUIPMENT

Throughout this policy document, "screen-based equipment" is defined as equipment which has a screen of any type which emits an illustrated display. Thus, the definition encompasses electronic video display terminals and other visual display terminals built around cathode ray tubes, light emitting diodes and other electronic sources and optical technologies, such as microform readers.

3. ERGONOMICS

Because it is impossible to divorce computer hardware from the environment in which it is used, a clear understanding of the term "ergonomics" is required. ACOA accepts the following definition of ergonomics:

"Ergonomics is the study of human performance at work. It aims to promote the well-being, safety and productivity of the worker by study of his/her capabilities and limitations in relation to the work system, machine or task and in relation to the physical, psychological and social environment in which he/she works. Thus it has research and applied aspects, and is concerned with the interaction of the three main elements in any work situation - worker, machine and environment."

PART THREE - HEALTH AND SAFETY POLICY

1. Screen-based equipment (SBE) is coming into widespread use in Australian Government Employment. Its introduction is largely in response to management requirements, rather than in response to workers' needs; experience indicates that the equipment rarely improves people's working conditions and can make them considerably worse.

2. Health Hazards of Screen Based Equipment

Screen-based equipment can pose several risks to health, amongst which are:

(1) cataracts of the eyes - arising from leakage of non-ionizing radiation;

(2) eyestrain and possible deterioration of sight - arising from screen characteristics and the visual environment;

(3) backache and muscle fatigue - arising from e.g. poorly designed workstation, poor working environment and work design;

(4) repetitive strain injuries of the fingers, hand, arm and shoulder - arising from e.g. excessive keystroke rates;

(5) stress-related conditions such as depression and neurosis - arising from e.g. poor system and work design;

(6) possible miscarriages and birth deformities thought to be linked to radiation;

(7) other health problems such as face rashes - arising from electrical discharge.

No satisfactory long-term follow-up study of operators of screen-based equipment has been performed, and so statements to the effect that the equipment does not or cannot damage e.g. eyes or eyesight, are without foundation. *In the light of disastrous experiences* associated with introduction of new technologies in the past, members should regard screen-based equipment as a possible cause of adverse health effects until it is shown to be safe.

3. Work Organisation

The possibly detrimental effects of working with screen-based equipment can be minimised by ensuring that such work is organised according to the following principles:

(1) The introduction of SBE's should not be accompanied by the creation of a job category 'SBE operator'. Jobs involving the use of SBE's should be spread around as much as possible. No-one should be required to spend more than half their working time using a screen.

(2) Anyone required to use SBE as part of their job should receive basic training prior to the introduction of the new equipment, on paid time. This is to allow them to become proficient in its operation, and to understand the likely hazards of the equipment, so that the reasons for regular eye and vision tests, for example, are understood. Follow-up training should be provided as and when required. Training material should include more than just oral presentations.

(3) Close work on SBE, whether on electronic terminal or microform reader, involves the muscles of the eyeball and the ciliary muscles inside the eye, in constant contractions and regular breaks are required to allow them to recover. These breaks should consist of at least ten minutes during an hour in addition to regular tea, meal and health breaks. Where work is of a continuous and visually demanding nature, work breaks of fifteen minutes during an hour are warranted. These breaks should be taken at the operator's discretion and should be taken away from the work station.

(4) Electronic SBE should never be allowed to pace or monitor the operator, such as for instance by logging errors or keystroke rates.

(5) By implication, incentive payment systems linking bonus rates to the number of keys stroked per hour or the number of errors committed should be emphatically rejected.

(6) SBE should be introduced on a small scale and always subject to ergonomic audit. Large rooms, filled with rows of terminals should be rejected.

4. International and national standards associations and the regulatory authorities have failed to set standards or criteria which should be met by screen-based equipment if workers' health is to be protected. Under these conditions, it is imperative that we improve our own standards, covering machine hardware, software, workstations and work environment. Due to the fast-changing nature of this technology, it is important that these standards keep abreast, or ahead of, the introduction of new technology.

Manufacturers' and suppliers' specifications should report whether machines satisfy ACOA criteria.

5. Ergonomics

When an organisation is contemplating the introduction of new technology that incorporates SBE, members should seek:

(1) full consultation prior to purchase;

(2) a full ergonomic assessment of the equipment once installed;

(3) a full environmental assessment of the working conditions;

(4) a medical assessment of anyone likely to use the equipment.

All efforts should be made before work starts to ensure that the workplace has been brought into line with the needs of the workers - rather than allowing the workers to be modified through the wearing of glare-shielding glasses or other protective equipment.

6. The consultation should be conducted at the tendering, evaluation, pre and post installation stage.

7. An ergonomic assessment should be carried out by an ergonomic consultant who is acceptable to both management and unions. The consultant's terms of reference should include:

(1) checking that suppliers' specifications are in fact met;

(2) checking that the workstation meets the ergonomic criteria spelt out in part four of this policy;

(3) checking that the work design meets sound ergonomic criteria.

8. An environmental assessment should be carried out by an industrial hygiene consultant who is acceptable to both management and unions. The consultant's terms of reference should include:

(1) checking that the lighting meets the criteria spelt out in part four of this policy (concentrating in particular on eliminating reflections and sources of glare);

(2) checking that noise, heat, ionizing and non-ionizing radiation emissions meet the criteria spelt out in part four of this policy.

9. Eye Testing

The initial vision and eye assessment for anyone required to use SBE as part of their work, should be carried out by an ophthalmologist or optometrist who is acceptable to both management and unions. At present, there does not exist a satisfactory package of eye and vision tests suitable for testing of SBE operators. In the interim, members should attempt to ensure that tests meet the following provisions:

(1) Eye tests should include a slit lamp biomicroscope examination of the lens to check for incipient or congenial cataracts.

(2) Vision tests should include as a minimum tests for distance visual acuity, near visual acuity and oculomotor co-ordination, as spelt out, for example, in the eye health and vision examination for VDU users recommended by the Australian Optometrical Association. (See Appendix 'A')

(3) Eyesight defects revealed by these tests do not necessarily mean that the person is visually unsuited for SBE operation, for their sight can be corrected by properly prescribed glasses or contact lenses. Under no circumstances should the tests alone be used as criteria for employment.

(4) People already wearing glasses may have out-of-date prescriptions, or be wearing bifocals which are unsuitable for SBE work. They should be provided with proper prescriptions as if their vision were uncorrected.

(5) Costs of tests, professional consultants and corrective glasses or lenses suitable for SBE work should all be borne by the employer, as they are an essential prerequisite for screen work.

(6) Medical records will be held as confidential and their contents will not be revealed to management or unions without the explicit consent of the individual concerned. Individuals must always be given access to their own medical records.

(7) Reports from the ophthalmologist or optometrist arising from the tests should be limited to a statement as to the suitability of the employee for SBE work, or the optical correction required to make the employee suitable and such reports should be made available in the first instance to the employee.

(8) SBE operators should receive vision and eye health re-examinations every year.

10. Where a member working in an organisation wishing to introduce SBE has a medical condition that precludes them from working with such equipment, e.g. photosensitive epilepsy, they should be provided with alternative work without loss of pay or entitlements.

11. Rest Breaks

(1) Rest breaks can provide a means of overcoming or avoiding fatigue in the performance of screen-based tasks. It is important to realise that it is the recovery value rather than the nominal duration of the rest break that is relevant. Rest breaks will normally be more acceptable to staff if they have the opportunity to participate in the decisions about their frequency, manner and duration.

(2) ACOA Members who operate screen-based equipment for continuous periods in excess of one hour per day are to be entitled to a rest break of 10-15 minutes duration over the one hour period. If the SBE work is one of several tasks performed, then a shorter break after two hours should be taken.

(3) Rest breaks are to be in addition to normal meal and tea and coffee breaks.

12. Maintenance of Equipment

Once SBE is installed, there should be regular checks on the equipment, working environment, and people involved, to ensure that major health problems do not arise.

(1) The equipment should receive regular maintenance and cleaning at least every six months. Suppliers of SBE should be required to offer maintenance contracts. Log-books for each terminal should be kept and made available to members and union officials upon request.

(2) The working environment should be monitored regularly, at least every six months, for noise levels, heat and humidity conditions, lighting levels, and to check for ionizing and non-ionizing radiation emissions.

(3) Results of all environmental monitoring should be made available to the members involved and ACOA.

(4) Medical checks should be provided at least every year for anyone required to use SBE as part of their work. This check should follow the same format as the pre-employment medical examination, and cover eye-examination, vision testing, and a general medical examination to check for repetitive strain injuries or postural fatigue. A further medical check should be undertaken whenever grounds for it arise, or whenever an employee requests such a check.

(5) Medical records will be held as confidential and their contents will not be revealed to management or unions without the explicit consent of the member concerned. Members must always have access to their own medical records.

13. In workplaces where SBE is already installed, the quality of the work environment and the equipment itself should be improved as far as possible to meet the criteria of this policy.

14. Protection for Pregnant Women

Female members are entitled to refuse to work on screen based equipment where they consider possible damage to themselves or birth defects in their unborn children.

Where the decision to refuse to work on SBE is made, members shall incur no loss of salary, position or industrial entitlements.

PART FOUR - SCREEN-BASED EQUIPMENT AND WORK ENVIRONMENT STANDARDS

1. Machine Hardware Criteria

(1) Visual Characteristics of Screen

(a) The image should be clear and stable and subject to brightness control.

(b) Colour combinations should be such as to impose least stress on the operator, compatible with the least production of radiation.

(c) Characters should be clearly distinguishable, such that:

- character height should be a minimum of 1 mm per 150 mm of viewing distance;
- character width should be up to 80 per cent of character height
- the space between characters should be between 20 and 50 per cent of character height;
- row spacing should be at least equal to character height

(d) There should be rolling and non-rolling display format

(e) The dot matrix for characters should be at least 7x9 or preferably 9x14.

(f) Screen phosphors should be refreshed at least 50 or 60 times per second to control flicker.

(g) The screen should be glare-resistant.

(h) Contrast should be variable and subject to operator control (minimum 3:1, maximum 10:1).

(i) Height to width ratio of the screen should be 3:4.

(j) On microform readers, there should be no lighting 'hot spots'.

(k) Microform readers should have matt screen finishes.

(2) Keyboard

(a) The keyboard should be detachable from the screen.

(b) Keyboard should be slim, and preferably no thicker than 3 cm.

(c) The keyboard layout should be similar to that of typewriters, with special function keys conveniently grouped and marked, to conform with ISO 3243 (for alphanumeric keyboards) and ISO 3791 (for numeric keyboards).

(d) Keys should provide audible and tactile feeback, both of which should be adjustable and under operator control.

(e) Key caps should be concave (i.e. dished) and have a matt finish.

(f) The keyboard surround should be matt finished, and be fitted with a wide palm-rest along its near edge.

(g) The keyboard should be sloped, preferably at around 12^{0} to the horizontal.

(3) Terminal

(a) The terminal should have a base that allows it to be tilted and rotated for maximum comfort.

(b) The case work around the screen should not be cluttered with controls.

(c) Equipment should be shielded, by being cased in metal or lined with metal foil, and it should be suitably earthed to minimise emission of non-ionizing radiation.

(d) There should be a fan to dissipate heat, but its operation should be silent.

(e) The machine should not 'hum' when turned on.

(f) The wiring and electronics should conform to Australian safety standards.

(g) Noise power rating of machine in use should be less than 50 dBA.

(h) Ionizing radiation emission should not be detectable.

(i) Non-ionizing radiation emission should be as low as possible. There are no standards governing non-ionizing radiation emission in Australia, apart from a draft standard issued on radio-frequency radiation. In the absence of acceptable standards, members should press for emission levels in line with forthcoming ACTU standards on this hazard.

(j) Cables and leads should be secured, labelled and concealed.

(k) The terminal screen should be shielded to withstand implosion.

(l) Manufacturers' specifications should include radiation emission characteristics.

2. Machine Software

(1) Programs for machine operation should be outlined in suppliers' specifications.

(2) Prompts, error messages and other diagnostics should be clear, concise and framed in good English.

(3) System crashes through operator error should be made impossible.

(4) Input and stored data should be protected from system crashes and machine failures.

(5) If several terminals share a common line or single computer, they should be able to operate independently.

(6) Programs recording operator characteristics such as error rates and keystroke rates, are unacceptable.

(7) Designers of software should receive ergonomic training.

3. Workstation

(1) Work surfaces should be of sufficient size to hold screen, keyboard, source documents, working paper and still leave room to rest the hands and arms.

(2) Work surfaces should be matt finished.

(3) Desk height should be adjustable to allow for optimal viewing angle and provide leg area that is free of obstruction.

(4) If the documents are suitable (e.g. A4 sheets) then document holders should be provided which bring the text into line of sight in front of the operator, preferably between the keyboard and screen.

(5) Chairs should be stable and swivel-topped, with a 5-point base. They should be fitted with glides for hard floor coverings and castors for carpet. They should provide maximum support without inhibiting the operator, and provide adjustable seat height, seat angle, backrest height and backrest angle - all of which should be easily adjustable from a seating position. Chairs should be firm, and inclined backwards at up to 8^{0}. They should be upholstered in a fabric that breathes (i.e. not plastic).

(6) The whole screen-based workstation should be such as to allow the operator to assume an optimum working posture:

- trunk, head, neck and arms should be in equilibrium;
- there should be lower back support;
- the line of vision should be approximately 15^{0} below the horizontal;
- Keyboard should be as close to knee height as possible;

The workstation should be designed to permit such an optimum posture.

4. Work Environment

(1) Lighting

(a) The ambient illuminance should be variable, e.g. under rheostat control, and lie between 150 and 300 lux.

(b) Ambient illuminance should not greatly exceed screen illuminance, and in any case the ratio should not exceed 4:1.

(c) There should be no reflections from screen, keyboard or working surface.

(d) There should be no sources of glare in the operator's field of vision, such as uncurtained windows or intense lights.

(e) Walls, floor and ceiling should be of matt finish.

(f) Lighting should be concealed, or if overhead, fitted with diffuser to distribute light evenly (outline of tube or bulb should not be visible).

(g) The operator's field of view should be uncluttered and restful on the eyes.

(h) Adjustable desk lighting should be provided for source documents.

(i) Luminance of screen and source documents should be well-balanced.

(2) Room Climate

The workroom should be air-conditioned, with temperature maintained between 21 and 23 degrees Celcius (subject to seasonal variation), and relative humidity between 45 and 55 per cent. (Filters and humidifiers in the air conditioning system should be regularly checked to ensure that they do not

become contaminated by bacteria, leading to people contracting such diseases as 'humidifer fever' or legionnaire's disease.

(3) Noise Levels

(a) Noise levels should be kept below:

- 50 dBA in areas where work involves concentration, conversation or communication
- 55 dBA in other areas.

(b) Impact printers should be insulated and separated from keyboard areas.

(4) Static Electricity

As far as possible, the workplace should be free of static electricity.

(5) Fittings, decor, electrical cabling

(a) Curtains should be bright, plain and composed of thick finely-meshed material. They can also contribute to noise insulation and absorption.

(b) Synthetic carpet material, if used, should be of a type with a copper wire interweave which can reduce the level of static buildup.

(c) Certain colours and colour schemes may be undesirable because of gloss finishes or darkness and must be avoided.

(d) Electrical cables must not be the potential cause of mishaps. Cables from equipment should conform with the appropriate safety regulations, and where possible be accessible only by tradesmen in the course of installation, maintenance or repair. The use of extension leads that criss-cross the work area poses safety problems and must not

occur. Power outlets should be positioned in such a manner to prevent accidents from occurring. Regular servicing of electrical wiring is essential.

(6) Office Accommodation

(a) The current Commonwealth Office Accommodation Guidelines are inadequate in terms of their ability to comprehend the significant changes to the working environment which accompanies technological change generally. Accommodation which may have been acceptable prior to the introduction of screen-based equipment invariably requires alteration to ensure that it is suitable in the changed environment;

(b) Where accommodation guidelines restrict the provision of an acceptable working environment for the operation of screen-based equipment, it is the clear responsibility of Departmental management to negotiate e.g. for increased space or improved accommodation. As part of their overall involvement in technological change processes, operators must be involved in decisions relating to accommodation requirements, floor plans, decor, etc.

PART FIVE - DECISION-MAKING PROCEDURES

1. Priorities and Responsibilities

(a) That changed technology tends to bring with it significant consequences for the psychosocial environment of the workplace - both positive and negative - is certain. It is a matter of concern that these implications have received far less attention from management than that given to the possibilities of cost-cutting and improved quality control. The pressures of staff ceilings in the APS has worsened this imbalance. Ignorance of the implications of technological change in the broad sense might also have been claimed, although this attitude is now patently untenably. Priority setting has also been incorrectly based due to uncertainty regarding the onus of responsibility in relation to the psychosocial environment. Such uncertainties, if they still exist, must be dispelled.

(b) To ensure that ACOA members are protected from potential ill-effects associated with new equipment and work methods, it is essential that priorities presently accorded to systems capabilities and cost comparisons must be reversed in favour of an approach which places the operator at the pivot of tender and installation considerations.

2. Participation

(a) The right of employees through their unions to be involved in a meaningful way in the decision-making processes which affect their working lives should be accepted by management.

The assessment of the implications of technological change for the physical working environment and for job satisfaction is an essential part of this process. As indicated earlier, it has been the Association's experience that management in the A.G.F. is constrained in consultation on these issues by

lack of readily available expertise or knowledge or resource areas, and, on occasion, by attitudinal concepts of managerial prerogative

(b) The specialist advice available from such areas as the Physical Working Environment Branch, Working Environment Division of the Department of Industrial Relations needs to receive much greater publicity within A.G.E.; if the resources of such areas currently limit the response which can be given to departments seeking guidance, those resources must be expanded to fill unmet needs.

(c) The Public Service Board is urged to clearly delineate existing areas of expert advice within A.G.E. concerning occupational safety and health and ergonomics. This is necessary to ensure the ability of management to participate fully in technological change negotiations and implement agreed procedures.

(d) ACOA seeks to promote the maximisation of meaningful participation by staff in the processes which potentially affect their working lives. While a good deal of lip-service is paid to participative ideals by management, staff often receive little benefit in practice.

(e) Existing and potential operators of screen-based equipment must be involved in the processes that have or are likely to have an effect on their daily working lives. The extent and level of such involvement must be jointly determined by staff, unions and management.

3. Tendering Procedures

(a) The emphasis on cost as the prime criteria for selection of equipment has been referred to above. While ACOA recognises the relevance of proper consideration to cost factors, the exclusion from specifications of factors relating to the interaction of machine, environment and operator is unacceptable to ACOA.

(b) Suppliers generally are not required to tender in relation to the ability of equipment to meet existing standards, nor in terms of significant factors relating to occupational safety and health and ergonomics such as:

- Keyboard Design and Layout
- Character Size and Spacing
- Legibility
- Flicker
- Screen Size and Colour
- Colour and Design
- Noise and Heat
- Adjustibility
- Radiation

(c) There is a clear need for the Public Service Board, the Purchasing Division of the Department of Administrative Services and the Inter-Departmental Committee on A.D.P. to individually and collectively re-assess the composition of tender specifications in the light of the implications for operators of the use of screen-based equipment. Departments should take an aggressive position when assessing their systems requirements and subsequently requesting supply. Suppliers should know where they stand and not be given the upper hand or be in the position to dictate the terms. Departments, with specialist assistance, if required, should insist that suppliers comply with at least minimum equipment standards that have been agreed to as being appropriate and necessary for a specific system or installation.

(d) Equipment modifications following installation are time consuming, disruptive and usually expensive. An awareness by departments/unions/operators of any unsuitable equipment characteristics can be achieved prior to installation if adequate consultation and participation takes place. Performance levels, besides those of a technical nature, are largely dependant on operator acceptance of the system. Technical aspects of the equipment combined with an operator acceptance will determine output and productivity levels.

It is in the best interests of all concerned that equipment designed to meet the operator's needs should receive priority in tender evaluations.

(e) Tender specifications must require suppliers to respond meaningfully in terms of the equipment's compliance with at least minimum standards relating to operational requirements.

(f) Consideration of tenders must place due weight on ergonomic factors; unions involved in technological change consultations must be provided with sufficient information to evaluate proposed equipment purchases in this regard.

PART SIX - GLOSSARY OF TERMS

ACCOMMODATION:	the ability of the eyes to adjust or accommodate different viewing distances
ASTIGMATISM:	a visual disorder caused by an uneven curvature of the cornea.
CATHODE RAY TUBE:	an electronic vacuum tube in which an electron beam is generated and used to energise a phosphor screen which thereby emits visible light.
CHARACTER:	the actual or coded representation of a digit, letter or special symbol but not a space.
DOT MATRIX CHARACTERS:	character images on a V.D.U. display screen which are represented by an appropriate number and location of dots within a defined cell or "matrix" of dot positions.
GLARE:	a visual condition caused by excessive luminance variations within the field of vision.
HARDWARE:	the physical equipment which makes up a computer system.
HYPEROPIA:	a visual disorder caused by insufficient refractive power of the eye (long sightedness).
ILLUMINANCE:	that part of the luminous flux that is incident on a unit area of a surface, a measure of the quantity of light with which a surface is illuminated. Measured in units of Lux (lx).

KEY FORCE: the force required to depress the key.

KEY TRAVEL: the displacement of the key from its static to fully depressed position; also called stroke.

LUMINANCE: measurement of light intensity at source. Measured in candela per square metre (cd/m^2).

LUMINAIRE: distributor of light from a light source.

MYOPIA: a visual disorder caused by excessive refractive power of the eyes (short sightedness).

PHOSPHOR: a coating of luminescent material which emits visible light when struck by electron beams.

PRESBYOPIA: the reduction of accommodation with age due to a progressive inability of the lens to change its shape thus limiting the range over which objects can be brought into focus.

RASTER SCAN: a method of scanning a C.R.T. display in a series of horizontal lines. The technique used in television receivers and most types of V.D.U.'s incorporating refreshed C.R.T.'s.

REFLECTANCE: the ratio between the quantity of light that is reflected from a given surface and the total quantity of light that is incident on the same surface.

REFLECTED GLARE: reflection of bright light sources

REFRESH RATE: the frequency with which the image on the face of refreshed C.R.T. is refreshed. Measured in units of Hertz (Hz).

VISUAL ACUITY: the ability of the eye to discriminate or resolve fine detail.

PART SEVEN

CHECKLIST

DEPT/AUTHORITY

LOCATION

SECTION SUB SECTION

NUMBER OF STAFF IN WORK AREA NUMBER OF MEMBERS

CLASSIFICATIONS

TYPE OF INSTALLATION (eg. Microfiche, etc.)

INSPECTED BY DATE OF INSPECTION

EQUIPMENT

BRAND

MODEL DATE OF INSTALLATION

PERIPHERALS (eg. C.P.U.s, Disc Units etc.)

SECTION A

	YES	NO
SCREEN		
1. What size is it?		
2. What colour is the screen?		
3. What colour are the characters?		
4. Is there adequate contrast between screen and characters?		
5. Are the characters legible and easily defined?		
6. Is there adequate spacing between the characters?		
7. Do the characters flicker or shimmer?		
KEYBOARD		
8. Does the equipment incorporate a keyboard?		
9. Is the keyboard detachable?		
10. Is there colour coding for command keys?		
11. Is the keyboard layout adequate for work task?		
12. Is there tactile or audio feedback for keying?		
ADJUSTABILITY		
13. Are there controls for screen contrast adjustment?		
14. Are there controls for screen brightness adjustment?		
15. Is the screen height adjustable?		
16. Is the screen angle adjustable?		
OTHER FACTORS		
17. Is the equipment (including peripherals) excessively noisy?		
18. Is the level of heat emmitted excessive?		
19. Has the equipment been tested for radiation emission?		

Summary of Findings.....

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SECTION B

LIGHTING

	YES	NO
20. Is the level of natural lighting excessive?.....		
21. Is the level of artificial lighting excessive?.....		
22. Is local lighting (ie. Dark Lamps) in use?.....		
23. Have any changes been made to the artificial light sources?		
24. Is the level of glare on the screen excessive?.....		
25. Is the level of glare on source documents excessive?.....		
26. Are reflections on the screen excessive?.....		
27. Are reflections on the source documents excessive?.....		

Summary of Findings.....

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SECTION C

SEATING

	YES	NO
28. Is the chair of adequate dimensions?.....		
29. Is the chair upholstered in vinyl?.....		
30. Is the chair upholstered in fabric?.....		
31. Does the chair have a five leg base?.....		
32. Does the chair have castors or glides?.....		

	YES	NO
33. Are castors or glides able to be locked?.....		
34. Does the chair have arm rests?.....		
35. Are footrests available or in use?.....		

ADJUSTABILITY

36. Is the chair adjustable in height?.....		
37. Is the back support adjustable?.....		
38. Are the armrests adjustable in height?.....		
39. Can all adjustments be made from a seated position?.....		

DESK/TABLE

40. Are a sufficient number of work surfaces provided?.....		
41. Are the work surfaces of sufficient size?.....		
42. Is a "standard issue" desk in use?.....		
43. Is the work surface adjustable in height?.....		
44. Is the surface of the desk/table matt finished?.....		
45. Is the underside of the desk/table free of obstruction?.....		

OTHER FACTORS

46. Are their curtains in the work or surrounding areas?.....		
47. Are there carpets on the floor?.....		
48. Is the decor pleasant?.....		
49. Is the amount of floor space adequate?.....		
50. Is the work area airconditioned?.....		
51. Is the airconditioning adequate for all climatic conditions?...		
52. Are electric cables and power points safe and out of harms way?		
53. Are document holders available or in use?.....		

Summary of Findings.....

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SECTION D

HEALTH	YES	NO
54. Are any operators suffering from: EYESTRAIN.....		
HEADACHES.....		
BACKACHES.....		
UNDUE STRESS.....		
NAUSEA.....		
NERVOUS TENSION.....		
55. Is the employing authority providing eyetests?.....		
56. Have any operators recently had their eyes tested?.....		
57. As a result of any eye examination are they:		
O.K.?.....		
Now wearing spectacles?.....		
Had new lenses prescribed?.....		
Been referred to a specialist?...		
58. Are formal rest breaks (other than meal, tea & health)provided?		
59. Have any operators lodged a compensation claim?.....		
60. If a compensation has been lodged, has it:		
Been successful?.....		
Been rejected?.....		
Not proceeded with?.....		

Summary of Findings.....

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WORK REQUIRMENTS	YES	NO
61. What percentage of the job deals with the screen based equipment?		
100 - 75% ☐		
50 - 70% ☐		
25 - 50% ☐		
0 - 25% ☐		
62. Is there any variety in the work done?.....		
63. Are the operators required to meet a quota? eg. Keystrokes per hour, forms output.....		
64. Are the operators working to daily/weekly/monthly deadlines?....		
65. What is the general level of job satisfaction?.....		
low.....		
reasonable...		
good.....		

Summary of Findings.....

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CONCLUSION, RECOMMENDATIONS AND

ACTION TAKEN

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APPENDIX 'A'

EYE HEALTH AND VISION EXAMINATION FOR SBE USERS

1. Examination of SBE Operators

1.1 All SBE operators should receive a comprehensive assessment of vision and eye health from an optometrist or ophthalmologist before commencement of work with the equipment. This assessment should not be a screening but should be a complete examination consisting at least of:

(i) taking of a case history
(ii) measurement of unaided visual acuity
(iii) examination of the external eye
(iv) ophthalmoscopic examination of the internal eye
(v) slit lamp biomicroscopic examination of the transparent structures of the eye in particular the crystalline lens
(vi) objective and subjective refraction of each eye and binocular balance
(vii) measurement of the amplitude of convergence and accommodation
(viii) measurement of phorias and duction
(ix) measurement of fusion and stereopsis
(x) testing of colour vision
(xi) measurement of visual field and/or tonometry.

1.2 Additional tests should be carried out when in the clinical judgement of the optometrist or ophthalmologist concerned they are considered necessary. The clinical judgement of the examining optometrist or ophthalmologist should be regarded as an over-riding principle in the testing of the vision of SBE operators.

1.3 Subsequently, SBE operators should receive complete vision and eye health examinations every two years. More frequent examinations of individuals should be conducted if in the opinion of the optometrist or ophthalmologist they are considered necessary.

1.4 SBE operators should receive an examination from an optometrist or ophthalmologist immediately any signs or symptoms of vision difficulties present.

1.5 Normal ethical standards regarding confidentiality should be maintained when examining SBE operators and the contents of optometric records should not be revealed to third parties without the explicit consent of the worker concerned.

2. Screening of SBE Operators

2.1 Vision screening should not be considered to be a substitute for a professional examination provided by an optometrist or ophthalmologist. The AOA does not favour the screening of SBE operators but understands that in some circumstances screenings may be warranted.

2.2 Optometrists or ophthalmologists should conduct the screenings. Other personnel can be trained to screen SBE staff but they cannot be expected to exercise the clinical judgement that comes from the broad training and clinical experience possessed by the eye care professionals. Interpretation of the results of screening tests is frequently difficult.

2.3 If lay-persons are to be used in conducting the screening of SBE operators, they should receive adequate training from an optometrist or ophthalmologist.

2.4 Screenings should be an adjunct to the procedures described in section 1 above. Complete vision and eye examinations should be received before the SBE operator commences work with the equipment and at least every two years after.

2.5 Any person failing the screening should immediately be referred to an optometrist or ophthalmologist. Any person complaining of symptoms of vision problems should also immediately be referred.

2.6 Screening should consist of

(i) testing of distance visual acuity using a Snellen letter chart at a distance of 6m from the subject. If the subject usually wears an optical correction it should be worn during the test. More than two errors with either eye in the 6/9 line indicates a need for referral.

(ii) testing of near visual acuity using a suitable near distance chart at the subject's normal working distance. If the subject normally wears an optical correction, it should be worn during the test. If the subject wears bifocals, the card should be viewed through the reading segment. Operators making more than two errors with either eye in the 6/9 line should be referred.

(iii) testing of oculomotor co-ordination using a Maddox wing test or its equivalent. Normal optical correction should be worn during the test. Referral is necessary when

(a) horizontal heterophoria exceeds 12 dioptres of exophoria or 5 prism dioptres of esophoria

(b) vertical heterophoria exceeds 1.5 prism dioptres.

2.7 There is no need to test colour vision at the screenings if a complete examination by an optometrist or ophthalmologist has been initially conducted.

December 1982

Source: Australain Optometrical Association Policy On the Vision of Screen Based Equipment Users.

AUSTRALIAN PUBLIC SERVICE ASSOCIATION
(FOURTH DIVISION OFFICERS)
Federal Council

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OUR REF. 23/8/30

YOUR REF

4th September, 1984

Mr. T.J. Talberg,
Secretary,
Joint Parliamentary Committee of
Public Accounts,
Parliament House,
CANBERRA 2600

Dear Mr. Talberg,

Occupational Health & Safety - Screen Based Equipment

I refer to your letter of July 23rd and enclose as requested APSA Policy documents on

. Screen and keyboard environments

. SBE Technical Criteria

. Repetition Strain Injury

As you will no doubt be aware, APSA is in dispute with the Department of Social Security regarding the introduction of STRATPLAN. Details relating to the proposed eye examinations for SBE operators comprise one of the remaining unresolved issues.

Yours faithfully,

V.B. McMullan
Federal Secretary/Treasurer

PF/lei
Enc.,

REPETITION STRAIN INJURY

APSA (FDO) POLICY

AUGUST 1984

SUMMARY - AREAS FOR ACTION

* With the objective of preventing RSI and instigating urgent action to ensure that all existing sufferers are provided with optimum conditions for recovery, APSA demands the implementation of detailed management strategies agreed in negotiation with the union, which are based on a sound analysis of the causes of RSI and which specifically include an early warning identification system and an ongoing program of preventive action.

* Early reporting/identification systems must include:

. provision to staff of management's written RSI policy as agreed with APSA emphasizing sympathetic handling of cases and giving undertakings that redeployment/rehabilitation action will be without loss of salary, conditions, status or job satisfaction

. the introduction of clearly defined reporting and information collection systems and reporting of all cases to the appropriate APSA State Branch

. ongoing education/training for supervisors, management and workers

. clear identification of management responsibilities for policy implementation and union liaison

. improvement of compensation claim handling

* Preventive Action Programs must:

. be based on a complete analysis and clear identification of causes

. provide a framework for dealing with individual cases

- include agreed strategies, actions to eliminate causes, timetables and targets

- provide for the use of agreed independent experts e.g. ergonomic/medical audits including six monthly medical monitoring

- provide resources for ongoing education/training

* For the purpose of ergonomic assessments, APSA's Screen and Keyboard Environments policy will be recognised as a minimum standard.

* The management practice of allocating a rate of work for a task must be abolished; work allocation systems must be agreed.

* Rest breaks of at least 15 minutes during each hour additional to personal health and meal breaks must be introduced and enforced.

* Training must be given to workers (prior to commencement of working in a new or changed job or with new furniture or equipment) in how to work "ergonomically".

* Job design/redesign to vary duties should be considered in consultation with the union.

* Management should encourage workers who report RSI symptoms to seek appropriate medical advice.

* The practice of insisting on "confirmation" of a doctor's diagnosis by a CMO/AGMO is without foundation and should not be employed.

* Management should clearly acknowledge workers' rights to access to Compensation, provide information and advice on Compensation matters in the workplace and deal with claims objectively and expeditiously.

* The Commonwealth Employees' Compensation Act should be amended to facilitate payment for home help, to provide for financial assistance with special travelling arrangements and to significantly increase the level and duration of weekly incapacity payments.

* Rehabilitation services of all types should be recognised under the Commonwealth Employees' Compensation Act.

* Post-diagnosis action by management in relation to an individual should be based on medical advice on the characteristics of the injury, possible causes, type and duration of treatment/rehabilitation and the limitations it places on work and should follow the specific steps outlined in the body of this policy.

* Where, after assessment and consultation, redeployment action is agreed as desirable, it shall in no circumstances involve a reduction in salary, conditions or status and will follow the principles and procedures outlined in the body of this policy.

* The worker's salary, employment conditions and employment status must be maintained through the full course of rehabilitation.

* Management must provide sufficient additional staffing to enable the use, where necessary, of permanent full-time staff to maintain necessary work output.

1. INTRODUCTION

The Australian Public Service Association (Fourth Division Officers) has some 35,000 members working in a variety of occupations in the Australian Public Service, N.T. Public Service and Commonwealth Statutory Authorities - many of them involved in repetitive work on keyboards and in clerical assistant functions. The increasing incidence of Repetition Strain/Occupational Overuse Injury amongst our membership in recent years represents the single most serious and alarming occupational health and safety issue for the union.

In the course of union activity around the issue, APSA has been faced with a range of unsatisfactory responses from management and Authorities with particular roles in relation to occupational health and safety in Australian Government Employment areas. The time is now long past when management could seek to disclaim responsibility for RSI. The simple fact is that the actions necessary to prevent the occurrence of RSI are well known. Management negligence is the key problem.

This policy document

- provides a definition of RSI, its symptoms and an outline of its causes
- deals in detail with prevention strategies
- specifies action to be taken in relation to the handling of existing and future cases
- discusses treatment and rehabilitation principles
- identifies areas where consultation with the union is required.

It is being served on management in all Australian Government Employment areas and will form the basis for negotiations between management and the unions at all levels.

Reference should also be made to the APSA publication "The RSI Sufferer's Handbook" (August 1984), APSA policy on Screen and Keyboard Environments - "A Safe and Healthy Job?" (reprinted April 1983) and APSA Screen and Keyboard Technical Criteria (revised and reprinted August 1984).

2. DEFINITION, CAUSES AND SYMPTOMS

Repetition Strain Injury and Occupational Overuse Injury are collective terms for a range of muscle and tendon injuries of the neck, shoulders, fingers, wrists, hands and elbows. Muscles and tendons are subject to two types of mechanical stress where -

"(i) static loading or continuous contraction is required of the muscles of the neck, shoulder girdles and upper arms to support and fix the arm in a position of function. The arm may be regarded as a lever.

(ii) dynamic loading or repetitive movement is often required of the forearm, wrist, hand and fingers to execute a task." *1

As with other forms of Occupational Overuse Injury, a single cause or a variety of interacting causes and/or contributing factors may be responsible for the injury - for example

- rate and frequency of repetitive movement
- degree of static muscle work
- stressful arrangement of job tasks
- individual work measurement, incentive schemes
- lack of adequate job training
- lack of adequate occupational health and safety training for workers/supervisors

A repetition injury will usually show up as pain, swelling or numbness in, or around, the affected muscles or tendons. This usually occurs in the fingers, one or both hands, wrists and on arms. In some cases the shoulders, neck and or back muscles can be affected.

At first the pain, swelling or numbness may occur only occasionally while the repetitive movement is actually being done. However if preventive action is not taken the condition will worsen. It may then persist while the worker is doing non-repetitive movements or even when they are not using the injured area at all. Symptoms may worsen as the working day or week progresses.

Thus, it is common for RSI to be referred to according to the stage and seriousness of the conditions. These stages are not absolutely fixed and separable, but reference to them assists in understanding the nature of the injury, the problems it causes and the principles on which proper prevention, treatment and rehabilitation strategies are based.

*1 Browne, C. Arthritis Foundation of Australia Symposium Paper September 1983

Stage 1	Pain occurs while working, but may stop with rest e.g. symptoms disappear while resting, overnight and on weekends. At this stage, there may be minimal or no reduction in work performance.
Stage 2	Pain occurs while working and continues after work but may stop by the following day. Ability to perform repetitive work declines.
Stage 3	Pain, fatigue and weakness continue while the limb is at rest and abates more slowly. Repetitive work cannot be done - worker needs time off but may return to a modified job when night pain stops.
Stage 4	Pain, fatigue and weakness is unrelieved except by lengthy periods of rest. Worker unable to work for months or years.
Stage 5	Chronic and persistent condition. The affected limb will have no functional use. The worker will never return to work.

Throughout these stages several conditions may be experienced:

"What are the clinical conditions making up RSI disorders? A variety of regional or poorly localised pain disorders acting singly or in combination to reduce work performance. They include:

- Tenosynovitis of the flexor (palm side) and extensor muscle/tendon compartments of the forearm, wrist and fingers. This condition is due to overload and overstrain of the muscle tendon structures and tendon sheaths and may cause swelling, pain and weakness of grip.

- Carpal tunnel syndrome is due usually to flexor tenosynovitis and flexed wrist posture. Causes numbness, pins and needles of the fingers, weakness of grip, uncoordination of hand function and night discomfort.

- Epicondylitis is pain arising at the elbow due to overstrain of the attachment to tendons at the inner and outer aspects of the elbow - so-called tennis and golfers elbow.

- Shoulder and neck pain is usually associated with adverse constrain posture in maintaining the arm in a functional position to perform a task. Static muscle loading and spasm occur with aching and difficulty in maintaining the shoulders in an elevated position.

During clinical examination the physical findings are usually semi objective with tenderness or pain on motion of a joint, numbness or pins and needles may occur in response to certain manoeuvres. Detecti of actual swelling or redness or other signs of inflammation are rare because the condition is fundamentally not inflammatory." *2

*2 Ibid

3. EFFECTIVE MANAGEMENT AND PREVENTION

The objective of APSA RSI policy is to prevent RSI and to instigate urgent action to ensure that all existing sufferers are provided with optimum conditions for recovery. This necessitates the implementation of detailed management strategies which have been agreed in negotiations and consultation with the union. These strategies must be based on a sound analysis of the causes of RSI and must include the two vital components

* an early warning/identification system

* an ongoing program of preventive action

Early Warning/Identification

RSI must be identified at the earliest possible stage to ensure that individual workers do not suffer permanent damage and that other workers performing similar jobs will not contract injuries. The crucial feature of an effective early warning system is the creation of an environment in which workers will report the earliest symptoms to the appropriate area of management (e.g. supervisor, occupational health nurse) and their union with the certainty that management will act immediately to ensure that preventive action is taken. Failure to report symptoms and seek medical attention in the earliest stage makes treatment and rehabilitation much more difficult and may result in permanent, irreversible damage.

Undoubtedly the main reason for failure to report symptoms is fear of the outcome i.e. management attitudes and practices may create a situation where workers perceive that it is not in their interests to be identified as having RSI. Fellow workers may, for example, have been treated with cynicism or disbelief, moved to an area remote from the established social network, given uninteresting or degrading work, deprived of Higher Duties Allowance, de-classified, threatened and harassed, sacked during probation or after long service on invalidity grounds. Even where these things have not been experienced in the workplace, a more general fear of the uncertain future, coupled with lack of knowledge of their rights, may inhibit early reporting of RSI.

It is therefore essential that management takes urgent action to remove obstacles to early reporting/identification.

Minimum requirements include -

* provision to staff of management's written RSI policy, which has been agreed with APSA, which emphasises that management will handle cases sympathetically and which gives an undertaking that redeployment/rehabilitation action will not involve loss of salary, conditions, status or job satisfaction

* the introduction of clearly defined reporting and information collection systems and the reporting of all cases to the appropriate APSA State Branch.
* the establishment of ongoing education/training for supervisors, management and workers in RSI prevention and case handling

* the clear identification of management responsibilities at all levels for RSI policy implementation and union liaison

* the implementation of changes necessary to achieve rapid handling of compensation matters within the Department/Authority.

Preventive Action Program

(i) Principles

The ongoing program of preventive action must be based on a complete analysis of the problem and the clearest possible identification of causal factors. The program must specify action to be taken to eliminate these causal factors across the board and must also provide the framework for dealing with existing individual RSI cases and any which occur in the future.

The following principles must be accepted by management to ensure the success of the program -

* commitment to consultation with the union on the development of the program

* commitment to implementing changes necessary to prevent the occurrence of injuries
* the use of agreed independent experts for various purposes including six monthly monitoring of staff by a medical practitioner experienced in RSI and for ergonomic audits.
* the provision of resources for education/training of workers, supervisors and management.

(ii) Preliminary analysis

The preliminary analysis of the problem must specify its extent and take account, at minimum, of those factors which are known to cause or contribute to RSI including -

* the frequency and duration of repetitive movements.

* the absence of adequate recuperative (rest) breaks.

* force used in performing the movements.

* the degree of static (fixed) muscle loading in the trunk, shoulders and arms.

* the degree of stress involved in the job contributed to by its boring, monotonous nature or the lack of opportunity for initiative, responsibility or individuality.

* sudden changes to rates of work e.g. caused by peaks or related to return to work after periods of leave exceeding three weeks; or peak workloads).

* individual monitoring of rates of work leading to stress and work pressure.

* bad equipment, workstation and/or working environment design.

The analysis will therefore typically involve union/management assessments based on the standards detailed in this document and other relevant APSA policies*3 and the use of agreed independent consultants (e.g. ergonomists, occupational therapists etc.) to carry out specific workplace audits. The preliminary analysis report should then form the basis for union/management consultation in relation to the preventive action program itself.

(iii) Compensation

Workers with RSI will typically be in a position to utilize Compensation payments once diagnosis has been established. Management should clearly acknowledge the workers' right to access to Compensation provisions and deal with their claims in a responsible and objective manner. Information and advice about Compensation matters should be made readily available in the workplace.

Rapid processing of claims by the employment authority is particularly important given the potential for severe financial hardship for workers on low incomes who may have exhausted sick leave entitlements.

Given the nature of the injuries and the length of the rehabilitation process, the Commonwealth Employees' Compensation Act should be amended to facilitate payment for home help in addition to the current provision applying to help of a personal nature (i.e. bathing, dressing etc.) and to provide for financial assistance with necessary special travel arrangements to and from work. In addition, the level & duration of weekly incapacity payments is unrealistic and should be significantly increased by Government action.

All forms of rehabilitation services, as well as those provided by the Commonwealth Rehabilitation Service, should be clearly recognised under the Act.

(iv) Prevention program

The on-going management prevention program should typically include details of agreed strategies, actions, timetables and targets in relation to all relevant aspects such as ergonomics, rate of work, work routine, training, job design, post diagnosis action, redeployment and rehabilitation. APSA's policy on these issues is detailed below.

*3 'A Safe and Healthy Job' APSA Policy on Screen & Keyboard Environments

APSA Technical Criteria for Screen & Keyboard Environments

APSA Work Measurement Policy

Ergonomics

As indicated above, APSA has produced detailed policy statements on the ergonomic aspects of Screen & Keyboard Environments including minimum acceptable standards for equipment, workstations etc. These documents have been widely distributed amongst members and management and are available for the Branch and Federal Offices of the union.

Rate of Work

Management imposition of a particular rate of work for a task is unacceptable because it places unnecessary stress on the worker involved, and in cases where the rate is unreasonable may be a cause of damage to health e.g. repetition strain injury. A reasonable rate of work varies with the capacities of the worker concerned and the type of work being done. It cannot be said that there is an absolute safe rate of work.

The rationale of work allocation must take these factors into account and should be arrived at in consultation with the workers involved through APSA. Where problems or disputes arise, management should initiate discussions with the union which must be provided with all the information necessary for a full assessment of the situation.

Work Routine

The availability of adequate rest breaks is necessary to avoid an accummulation of fatigue and strain which contributes to repetition strain injuries where repetitive work is performed.

Adequate rest breaks must therefore be provided for and should be -

* developed in consultation with workers and the union.

* of at least a total of 15 minutes during each hour additional to personal health and meal breaks.

* maximised rather than minimised.

The purpose of these rest breaks is to refresh the muscles and tendons of the body and/or eyes thus the breaks should not involve other forms of work. These rest periods should also have a psychologically refreshing effect and the worker should therefore be able to decide how the time is spent. Management must make it clear that rest breaks take precedence over work output considerations.

Programmed exercises or prescribed/proscribed activities during rest breaks must be optional and should not take up more than one third of the rest breaks. Certain exercises and activity may be a beneficial counter to the sedentary nature of the work, however these should only be developed on the advice of a suitably experienced occupational therapist, in consultation with APSA and only after a thorough examination of a particular workplace and work tasks.

Training

In addition to providing a workplace which is ergonomically acceptable, with fully adjustable workstations, chairs, and properly designed equipment, the employer must ensure that prior to the commencement of working in a new or changed job or with new furniture or equipment, all workers are taught how to work in accordance with recognised ergonomic principles and why this is important. It is of course also necessary to ensure that "reminders" or "up-dates" of this information are regularly carried out.

It takes the body approximately 6 weeks to adjust to a new posture. This can cause discomfort to the operator and follow-up training, reassurance and support is necessary. Without this, many operators will adjust the ergonomic furniture back to the proportions they were used to.

Training should cover -

* ergonomic principles associated with chairs, workstations, posture etc.

* ways of making necessary adjustments to furniture and equipment.

* points to regularly monitor in the workplace to ensure it remains ergonomically sound.

* information on the potential hazards associated with the work (such as repetition injuries, postural and ergonomic problems, chemicals or other hazards in the area) and preventive strategies including the importance of a safe work rate and adequate rest breaks.

* information on the management health and safety policy and strategy and the role of the union and workers in the strategy.

* information on health and safety tests and/or monitoring systems and the procedures/entitlements associated with accident/injury reporting and compensation systems.

Job Design

Job design is a significant but often neglected aspect of RSI prevention. Despite attention to factors such as ergonomics and rest breaks, the existence of jobs which are comprised entirely of one repetitive function, such as keying or sorting, will continue to put workers at risk.

Design or redesign of jobs so that a range of different functions are performed should therefore be considered. Because of the constraints of existing classification structures and position classification standards, the work value implications of multi-skilling and the need to take into account the interests of workers in other areas who may be directly or indirectly affected by re-organisation and reallocation of work it is particularly essential that job design proposals are the subject of consultation with the union at the earliest developmental stage.

Post-diagnosis action

When a case of RSI is medically diagnosed, management should assess necessary action on the basis of medical advice on -

* the extent of the injury including precisely which muscle groupings are effected
* the possible cause(s) of the injury
* the course of treatment recommended
* the length of time needed for rehabilitation
* the limitations placed on employment in terms of both tasks and recommended duration of work.

The following specific steps should be taken -

* an independent assessment of the working environment, job design, rate of work and work routine by suitably qualified agreed personnel.
* provision of the experts' assessments to the employee and the relevant APSA Branch to assist in rehabilitation and monitoring of the injury.
* implementation where appropriate of changes necessary to enable the worker to return to their position e.g. ergonomic improvements, changes to work organisation and methods (including rest breaks).
* implementation where appropriate of suitable retraining and redeployment strategies (see below).
* institution of arrangements for continuing monitoring by health professionals to ascertain the effectiveness of agreed action.
* the granting of access to the workplace by health professionals who are treating the sufferer and who are interested in making their own assessments of the situation.
* training of the worker in the application of ergonomic and preventive principles.

Redeployment

As the nature of these injuries is related to overuse and repetitive strain it is generally accepted that treatment, in the early stages, consists predominantly of rest and/or immobilisation and the cessation of repetitive tasks.

Workers often present medical certificates recommending 'light duties', 'no keyboard work' etc., and they are assigned to other duties on an ad hoc basis. There is little or no investigation of whether these duties are suitable and the onus is therefore placed on the sufferer to notify the inappropriateness of the position. This causes friction between the people in the work area, the sufferer and management due to a lack of understanding of the work limitations placed on the sufferer.

It has been common practice in Australian Government Employment for RSI sufferers to be used to fill clerical shortfalls in areas where there is a backlog of monotonous work. This is unacceptable, as it places the sufferer in a high stress situation, due to the tedious and monotonous nature of work which does not aid in the effective rehabilitation of the sufferer and may in fact aggravate the injury.

Where it is decided that redeployment is the most desirable of the options which can be made available (consistent with the doctor's rehabilitation program) the following principles and procedures should be applied -

* There should be full consultation with the employee on options and procedures prior to any decisions being taken. This must involve real consideration of the employee in regard to employment and career options.
* Redeployment will not under any circumstances involve a reduction in salary, conditions or status.
* Detailed job descriptions of prospective positions should subsequently be provided to the employee, their treating medical practitioner/s and the relevant Branch of the union.
* Modifications to prospective positions to make them suitable in the light of the nature of the injury and treatment should be undertaken where necessary.
* A graduated return to work (e.g. two days per week for the first month etc.) should be arranged where appropriate *
* Under no circumstances should an employee be pressured to alter their employment status from full-time to part time.
* Medical monitoring should continue throughout the redeployment action.
* Management should ensure that feedback from the employee is maximised and on-going, particularly with regard to job satisfaction.
* Full documentation of the redeployment activities should be maintained.

* It is not uncommon for later stage sufferers to have a rehabilitation program of 18 months to 2 years; a graduated return to work may lessen the risk of recurrence and the anxiety associated with return to work after a prolonged absence.

* In cases where redeployment is unsuccessful, a written report which fully documents the action taken should be made to the appropriate authority with a view to instituting formal redeployment procedures under applicable legislation (e.g. the CE(RR) Act where the organisation is prescribed), regulations or specified redeployment processes. APSA will oppose redeployment being instituted under these formal procedures in cases where the redeployment strategy as outlined in this document have not been followed or have not been completed.

4. TREATMENT AND REHABILITATION PRINCIPLES

Once a worker is medically diagnosed as suffering from repetition strain injury the appropriate course of treatment will depend on the doctor's recommendations. It is important that a worker who reports RSI symptoms is encouraged to go to a doctor who is aware of the range of occupational overuse injuries and who is prepared to diagnose and treat them in the most direct way.

An accurate diagnosis following a detailed anatomical examination will note carefully the precise nature and location of the injury. This is important because if only one or two specific locations are injured it may be possible to deduce which aspect(s) of the job caused the injury and because it provides an accurate reference point for measuring rehabilitation progress.

There is no requirement for a doctor's diagnosis of RSI to be 'confirmed' by a Commonwealth/Government Medical Officer (CMO/AGMO). In addition, experience suggests that CMO's/AGMO's may not be trained to deal adequately with RSI cases. The role of CMO/AGMO should therefore be restricted to assessments of fitness for work required under specific Regulations and/or Acts and assistance to management in identifying limitations imposed by the injury. It is the role of the worker's doctor to monitor the physical progress of the injury and advise on the limitations this imposes. If a formal "confirmation" examination is required in a disputed case this should be carried out by a medical practitioner agreed to by APSA.

In cases where the treating doctor can readily identify the cause of RSI, have the hazard eliminated and return the person to work without loss of time, medical follow-up to ensure that the injury does not re-develop is essential. When the injury is more extensive, acute or debilitating, specific remedial treatment should commence.

The goal of the rehabilitation processes is to ensure that the worker eventually has a satisfying, full-time permanent job which can be performed within any limitations imposed by the injury. Management commitment to this concept is essential.

It is important that the worker's conditions of employment are guaranteed during rehabilitation. The employer has been responsible for the contraction of a preventable work-related injury and thus has a legal and moral responsibility to minimise the costs to the worker.

While a number of options are possible they must be consistent with the principle of maintaining the worker's employment status (i.e. substantive level or in the case of long-term Higher Duties, their Acting level) through the full course of rehabilitation. Sufficient staffing cover must be provided to enable the use of additional permanent full time staff to maintain necessary work output.

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HEALTH AND SAFETY BULLETIN

Number 29 June 1983

ACTU HEALTH & SAFETY POLICY : PREVENTION OF REPETITIVE STRAIN INJURY

In May 1983, the Executive of the Australian Council of Trade Unions adopted a health and safety policy on prevention of repetitive strain injury. The policy notes the types of work associated with RSI, and outlines a strategy for unions to pursue through negotiation with employers to prevent such injuries from occurring.

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ACTU HEALTH AND SAFETY POLICY

PREVENTION OF REPETITIVE STRAIN INJURY.

1. Repetitive strain injury (RSI) is the collective name given to muscle and tendon injuries resulting from the continuous hand and body movements and static muscle load demanded by numerous forms of repetitive work. RSI includes such conditions as:

   * tenosynovitis
   * synovitis
   * carpal tunnel syndrome
   * bursitis
   * tendinitis and peritendinitis
   * epicondylitis
   * ganglion
   * tension neck syndrome
   * Dupuytrens contracture,

   and other injuries associated with repetitive over-use of hand, arm, neck and shoulder muscles.

   Aspects of repetitive work most strongly linked with the development of RSI include :

   * force, speed and direction of movement
   * frequency of movement
   * total number of movements
   * work posture
   * rate of work
   * stressful working environments.

   RSI arises from :

   * poor workplace design
   * poor tools and equipment design
   * poor job design
   * poor workplace administrative procedures
   * excessive work rates.

   Personal factors, such as sex, ethnicity or age, are unimportant when compared with these basic occupational factors involved in RSI.

2. The only acceptable policy is one based on prevention - which means tackling the occupational causes of RSI at source, by modifying the workplace and work processes to remove those causes or reduce their influence, and by excluding them at the design stage. A policy of dealing with RSI through medically monitoring the workforce to identify those workers who are supposedly "susceptible" to RSI and excluding them from employment; or to pick up the victims of RSI and "curing" them through surgical or physiotherapeutic techniques, is unacceptable.

3. Where cases of RSI are known to exist, a union strategy must begin with a detailed survey to ascertain the true dimensions of the problem, including the number and type of RSIs occurring; and the work areas, processes, tasks, work rates, incentive and team systems associated with them.

A full scale medical survey should be demanded, to be paid for by the employer. The survey should be carried out by a health professional acceptable to the union(s) involved, and in accordance with a protocol which is agreed in advance. In order to avoid underestimation of the problem, the protocol should specify that every effort should be made to follow up members who are off work on compensation, or who have left the job.

A full scale ergonomic survey should be demanded, to inquire into the factors in the workplace which have given rise to the problems identified in the medical survey, and to propose ergonomic solutions to these problems. Again this survey should be carried out by a fully-qualified ergonomist who is acceptable to both management and unions, and the survey should be conducted according to a protocol which is agreed in advance. The survey should be carried out at management expense. The report of the survey should be made available to the unions at the same time as to management. The ergonomic survey should address itself to such factors as workplace design, task design and rates of work, as detailed below.

An education programme (drawn up jointly between management and union) to outline to workers the causes and prevention of RSI should take priority in workplaces with an existing problem.

Early reporting of RSI symptoms to union and management representatives is essential and must be encouraged. If an occupational health nurse or physician is available they too should be immediately notified. Special attention needs to be taken by unions to ensure workers reporting symptoms are not victimised or in any way disadvantaged by their reporting.

Workers injured through the course of employment should maintain the right to job rehabilitation and/or retraining. Rehabilitation and retraining programmes for workers suffering from RSI should be jointly mounted by management and unions, enlisting the appropriate professional help as required. Alternative work for rehabilitation must not include jobs requiring extensive use of the affected muscles and tendons, and should be allocated in consultation with the union, the member and their health advisers.

Unions with members suffering from RSI should ensure that they receive swift and full financial compensation. Legal assistance should be sought with respect to claims for damages at Common Law.

4. The preventive strategies to be pursued by unions, if necessary in consultation and with the advice of professional ergonomists, include :

(i) Modifications to the workplace, equipment, and task organisation, according to sound ergonomic principles, (for example, changes to bench heights, seating, machine design, tool design, number and frequency of movements required by the worker) contribute to the prevention of RSI. It is essential that workers be trained to ensure that work is carried out according to sound ergonomic principles.

(ii) Elimination of single-task jobs.
Boring and repetitive assembly work and process work, where the job has been deskilled and specialised to the maximum degree, is most frequently associated with RSI, and the elimination of such jobs is fundamental to the eradication of RSI.

(iii) Setting work rates.
Workers should be able to complete work at a rate that is comfortable for them and does not lead to the development of RSIs. Work allocation should be set jointly by unions and management on the basis of ergonomic studies and experience which reveal whether a given rate is likely to cause RSI problems or not. A cautious approach is essential in setting rates and targets where the work or job is new and there is no previous experience to act as a guide. Work rates should be set as job entry requirements only, and not be used to monitor or discipline workers. Electronic monitoring of work rates, for example such as that employed amongst workers using screen-based equipment, is unacceptable, both for normal work and for determining work rates. Machine-paced work is to be discouraged. Pressure exerted by line supervisors to reach quotas should be discouraged. The long term goal of unions should be the elimination of externally set work rates altogether.

(iv) Job rotation.
Workers should be rotated frequently away from repetitive work, to alleviate boredom and to ensure that a variety of sets of muscles and tendons is used. Sufficient time should be given to allow recuperation.

(v) Provision of rest breaks.
Where job variety and rotation does not exist the provision of rest breaks which allow rest and movement away from the performance of the same single task is vital. While the exact length and frequency of such breaks will depend on the nature of the task, regular breaks of at least 15 minutes within every hour are required for repetitive work which does not involve adequate variety and rotation.

(vi) Accustomisation.
Workers who are newly employed, or who are returning from an absence of two weeks or more need to be allowed a period of adjustment to repetitive work which allows their muscles and tendons to become accustomed to the job demands. The adjustment period should be negotiated by unions and management, but should last for a minimum period of one working week. This can be achieved by job rotation and rest breaks. Work rates should only be increased gradually over the period of accustomisation.

(vii) Symptoms Reporting.
An appropriate line of communication between shop floor and management must be established for reporting symptoms, free from victimisation. Supervisors must be encouraged to co-operate, and should be involved in shop floor training schemes. Schemes where supervisors are judged solely by line output must be eliminated.

5. In accordance with ACTU health and safety policy, affiliates should avoid negotiating danger money for members required to perform repetitive tasks. In accordance with this present policy, affiliates should place primary emphasis on changing the workplace to remove the need for repetitive work. Affiliates' attention is drawn to the strong association between incentive and bonus schemes and the presence of RSI problems.

6. Affiliates should ensure that employers who require members to perform repetitive work provide those members with a full training and induction programme. This programme should be agreed in advance with the union. The training should include instruction in the causes and prevention of RSI, in the efficient use of muscles, and in recommended safe working practices.

7. All members required to perform repetitive tasks should be presumed to be at risk of developing RSI, whatever measures have been negotiated to make the work and workplace safer. Therefore they should have access to a medical monitoring programme, provided at the employer's expense. These medical checks should be conducted by a mutually agreed medical practitioner at least every two years, and include as a minimum the tests:

   - assessment of active and passive hand, wrist, forearm, shoulder and neck movements;
   - isometric muscle contraction against resistance;
   - muscle stretching;
   - palpation for muscle tone, hardening and tenderness;
   - examining for the presence of local swelling, particularly around tendons and their muscle and bone junctions;
   - hand grip power measurement (using for example a Martins Vigorimeter), conducted twice with a straight elbow and twice with the elbow flexed. The highest recorded value should be chosen as the measure of the respective function;
   - other special test movements as required.

Results of all medical monitoring should be held as confidential by the practitioner, and their contents not be revealed to management or unions without the explicit consent of the individual concerned. Individual members must always be given access to their own medical records.

Unions should encourage their members to report symptoms of RSI, and ensure that they are protected from victimisation or loss of wages by negotiating in advance that they will be transferred to non-repetitive work at the same salary. Unions should also ensure that such members are provided with full rehabilitation and retraining facilities.

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HEALTH AND SAFETY BULLETIN

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GUIDELINES

for working with

SCREEN-BASED EQUIPMENT

1. Introduction
2. Who uses screen-based equipment
3. Basic technology of screen-based equipment
4. The health hazards of screen-based equipment :
   1) cataracts of the eye
   2) visual discomfort and eyestrain
   3) postural and repetitive movement injuries
   4) other effects
5. Case studies of trade union action on screen-based equipment
6. Regulations, standards and management guidelines on screen-based equipment
7. A workplace strategy and checklist for screen-based equipment
8. Recommended ACTU/VTHC health and safety policy: screen-based equipment
9. Guide to further reading

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PREFACE

This is the first in a series of guidelines on specific hazards and occupational diseases to be issued to ACTU and VTHC affiliates. Other guidelines in the series will cover such hazards as :

* heat
* dusts (asbestos, sand-blasting etc).
* noise
* vibration (pneumatic tools, chain saws, commercial vehicles etc).
* non-ionizing radiation (lasers, UV, IR, MW and RF radiation)
* ionizing radiation (ores, radioisotopes, x-rays etc).
* toxic chemicals
* biological hazards
* stressful working conditions

The guidelines will also cover trade union policies and strategies to defeat the major occupational injuries and diseases :

* back pain
* dermatitis and skin problems
* allergies, particularly asthma
* cancer
* heart disease
* birth deformities
* sterility

Each of the guidelines will follow a similar format. There will be an introduction outlining the significance of the hazard or disease, and indicating which unions have a special interest in the subject. Then for hazards there will follow a brief technical explanation of the nature of the hazard; its major health effects; the possibilities available for environmental monitoring of the hazard in the workplace, and for medical monitoring of people exposed to the hazard; the standards and regulations that apply to the hazard; a brief account of trade union action already taken to curb the hazard; a recommended workplace strategy to deal with the hazard; and finally a recommended ACTU and VTHC policy to be implemented by all affiliated unions. For diseases there will be a similar format, with the emphasis being placed on the workplace factors known to cause the disease, and on what demands are appropriate to control these factors.

Where possible, guidelines will be offered in the formulating of health and safety clauses to be placed in awards and determinations.

Since this series of guidelines represent a new departure for the ACTU and VTHC, it is to be hoped that they will be subjected to widespread discussion, critical review, and practical testing in the workplace.

Comments and suggested amendments from affiliated organisations will be welcome. Eventually the recommended policy for each hazard or disease, duly amended in the light of experience and comments received, will be put to the ACTU and VTHC Executives for adoption as full policy.

The adopted policies will be published, together with their supporting guidelines, as booklets for the use of affiliates in mounting campaigns to control workplace hazards and diseases. They will be backed up by simplified pamphlets (to be published in a variety of languages) and posters.

It is intended that the set of guidelines will be published, together with supporting material, as a manual for trade union officials and health and safety delegates.

"Over and above the evil effects of a sedentary life, the affliction in store for those who do fine work, as a result of their craft, is myopia, a well-known affliction of the eyes which obliges one to bring objects closer and closer to the eyes in order to see them clearly. But it would help such workers very much if besides wearing spectacles they would give up the habit of keeping the head constantly bent and the eyes fixed on what they are making, if they would now and again drop their work and turn their eyes elsewhere or snatch a respite of several hours from their task and rest their eyes by looking at a number of different things."

Ramazzini, Diseases of Occupation, 1700[1]

"Apparently, the interruptions (rest pauses of ten minutes) in close visual work throughout the day were sufficient to prevent an accumulation of the tonus of the ocular muscles. It is conceivable that the time required to dissipate muscular fatigue may eventually prove to be an important datum in the field of ocular hygiene for determining the duration of rest periods."

Luckiesh & Moss, American Journal of Ophthalmology, 1935[2]

INTRODUCTION

The two quotations show that the problem of eyestrain, and the need for rest breaks in close visual work, has been recognized for a long time. But with the widespread introduction of electronic visual display units and microfiche readers in the 1960's and 1970's, unions have had to wring this recognition from reluctant managements and a reluctant medical profession, all over again. Yet the demand is justified historically, scientifically and socially, and it remains the centrepiece of a trade union policy on screen-based equipment.

According to a Swedish IBM report released in 1979, today some 13 out of 100 Swedish salaried workers daily sit at a VDU, and more than 25 in 100 (or 1 in 4) of the total Swedish active workforce come daily into contact with computerized information.(3) If the same conditions apply in Australia (and if they don't yet they soon will), this means that every day some 309,400 Australian workers sit at a VDU.(12) This is a population at risk greater than the combined ranks of miners.

VDTs have become so entrenched in newspaper offices now, that a journalist's productivity is measured in "screens per shift". A journalist at a highly computerised agency like Australian Associated Press may turn out 40 'screens' per shift (about 6,000 words); a sub-editor may deal with 200 'screens' per shift.

Quite apart from the spread of computers and electronic display systems, there is an equally strong tide in favour of miniaturisation of documents. Large organisations are finding it increasingly difficult to cope with their data storage and filing problems, and have turned to microfilm for a solution. The resulting plethora of microfiche and microfilm readers (together with cameras etc. known as micrographic equipment) is increasingly being used continuously - by people for the analysis of computer-output-on-microfilm (COM) for instance. Yet the readers and viewers available have tended to lag behind this emphasis, and tend to be so poorly designed as to constitute a severe visual hazard if used for long periods.

Computerisation and micrographics are (sometimes) wonderful things for an organisation - but rarely have they brought joy to individuals. Screen-based equipment seldom improves people's working conditions, and experience shows that it can make them considerably worse.

The design of some of the video display terminals (VDTs) in early computer systems was unbelievably bad, treating the operator as an unimportant adjunct of a well-tuned machine. But as the trade unions started to become active on this issue, and began

issuing guidelines to their members e.g. ASTMS in the U.K. in 1978(4), the producers of equipment quickly took note. It was not long before ASTMS was besieged by computer companies informing the union that their VDTs fully met union specifications!

This shift means that most VDTs on the market today are far superior to those found as little as 5 years ago. Many terminals are now promoted as being ergonomically sound. Problems of X-radiation, which have attracted a great deal of attention, are diminished by the use of cathode ray tubes with lower voltage supplies. However problems with ulta-violet light and other forms of non-ionising radiation remain unresolved. But many workers, indeed most workers, are forced to continue to use the older poorly designed and poorly maintained machines.

Much new equipment is installed thoughtlessly into an unsuitable office environment, creating problems of glare and reflections; and frequently the introduction of new technology is accompanied by productivity deals and tighter work discipline making typists and data-entry workers virtual prisoners of a machine. Those are the major problems today with the health and safety of screen-based equipment.

Several unions in Australia have taken major initiatives on this front. The white-collar union ADSTE has had a policy for sometime, while more recently the public sector union APSA and the Federated Clerks have engaged in long negotiations with the Public Service Board, and have achieved an important breakthrough in the Tax Office. Within Telecom, the APTU, ATEA and other unions have campaigned hard on SBE. Now unions are ensuring that all details of SBE operation are settled before installation, as exemplified by the current policy of the Municipal Officers Association at the Country Roads Board.

The print unions have pursued an active policy over the introduction of new technology in printing. The railworkers' union ARU has recently achieved considerable gains for clerical members working with screen-based equipment at VicRail. Many other unions are pursuing similar policies.

Several excellent agreements have been negotiated, such as the guidelines for VDU use in the AMP Society, while managements have elsewhere been stimulated to issue their own guidelines, notably the Public Service Board. The Federal Government has issued guidelines on 'VDUs at Work' in its Working Environment Series, while the National Health and Medical Research Council is putting the finishing touches to an Occupational Health Guide on VDUs, and has already issued a Guide on Eye Tests for VDU Operators.

It is this intense activity, on the part of unions, managements and the regulatory authorities, that prompts these ACTU and VTHC guidelines on screen-based equipment.

WHO USES SCREEN-BASED EQUIPMENT?

Screen-based equipment (SBE) refers to the new breed of information capturing, processing, storing or retrieving machines that use a display screen as one of their components. They can be electronic, when the images on the screen are produced electronically (the screen is in fact a cathode ray tube), or they can be optical, when the image is produced by a light source, mirrors, lenses, as in microfiche readers.

The use of VDUs is expanding rapidly. Firstly there are computer terminals and VDUs appearing in office systems in banks, insurance offices, hospitals, for stocktaking and sales, recording of contracts, handling of accounting data and many other uses. VDUs are increasingly used in scientific and technical work, and many engineers spend their whole working lives at them as a result of computer-aided design. Printing and

typesetting have been fundamentally altered by the advent of computers and microprocessors, and phototypesetters and VDT proofreaders spend their whole time at a screen performing a visually demanding task.

The price of silicon chips used for storage and processing of electronic information continues to fall, while their capacity increases, and this can only reinforce the trend towards a social information system that is largely electronic, rather than paper-based as at moment (filing cards, letters and memos, newspapers, books and magazines).

At the same time the process of optical miniaturisation of stored information is also rapidly growing. Already several of the world's great libraries have microfilmed their entire collections (e.g. the Library of Congress in Washington) and many newspapers and journals are now simultaneously available in ordinary 'paper' and microform versions. Large catalogues and registries that require frequent updating are now normally produced in microform, such as motor industry parts catalogues. Users of this equipment may find it trying, but they are rarely bound to it continuously. But other developments are more threatening. The telephone authorities in Scandinavia are transferring the central telephone directories to microform, and this will force Directories Enquiries workers to use microfilm viewers for the whole of the working day. And the most significant development of all is the direct computer output on microform (COM), introduced in the late 1960s to avoid problems of mounting piles of computer print-out. The result for many office workers is constant work at a microform viewer with this COM, scanning it for filing purposes or to extract information.

THE BASIC TECHNOLOGY OF SBE

The cathode ray tube or CRT is the basic element around which visual display terminals are constructed. A CRT is an evacuated glass tube with an electron 'gun' at one end and a screen, coated with a light-emitting material called a phosphor, at the other. When a high electrical voltage - usually between 12 and 15 kilo volts is supplied to the electron gun, a stream of electrons is produced. The stream is focussed magnetically and directed to any desired position on the face of the screen by adjusting the strength of the electromagnetic field. When the beam strikes the phosphor coating, energy is exchanged and the phosphor emits light. To the observer, the impact is seen as a speck of light. Characters and images are built up by a process of extremely rapid scanning backwards and forwards across the screen by the electron beam - exactly as in the production of images by a television set. The visual quality of the display is crucially dependent on the way the characters are built up, the type of phosphor, and on the rate at which the scanning beam returns to 'refresh' the character. A slow rate of return, for instance, leads to an annoying flicker in the image.

The scanning control circuitry sweeps the electron beam across the CRT screen in a series of regularly spaced horizontal or vertical lines. The character images are written on the face of the screen by switching the beam 'on' and 'off' very rapidly as it travels through its scanning pattern.

The light emitting coating of the screen, called a phosphor, is a crystalline compound - normally a sulphide or fluoride. Different phosphors have different light emitting efficiencies, decay rates and colour emission, and so they have a direct bearing on the quality of the image.

Each brand of VDT comes equipped with circuitry or built-in program which determines how the characters will be formed. Most machines today use a 7 x 4 dot matix, or for superior delineation of text, a 9 x 14 matix. A few hours work at a VDU will convince anyone that the software which determines the shape and legibility of

the characters on the screen is a very important part of the basic technology of the VDT.

Another important part of the VDT is the keyboard. For the best part of 100 years the typewriter keyboard has remained unchanged, with generations of typists trained to touch type on the familiar QWERTY layout. What is perhaps not so well known is that this layout was designed in the 19th century by Remington to be as unergonomic as possible - to slow the typist down to the speed at which the keys would not jam.

Today it is understood that a more rational keyboard layout and design is possible - but progress is hampered by the lack of standardisation. However some firms such as Data-Saab in Sweden are producing ergonomically designed keyboards that fit naturally under the hands.

Micrographic technology, by contrast, is an entirely optical technology - it involves only light, mirrors and lenses. Microimages are produced by two basic processes. They can be taken one at a time on a strip of film, then stored on reels, or loaded into cartridges, or cut into lengths and stored in a roll film jacket. Or microfiche can be produced, either directly from documents of from film strips. A fiche of A6 size (105 x 148 mm - about 4 x 6 inches) could contain 98 or even up to 200 microimages indexed at the bottom right hand corner. Film strips are produced using ordinary silver emulsion, but fiches are increasingly produced using cheaper diazo or vesicular film, which give them those characteristic blue, brown or green appearances. Both these films need to be exposed in ultraviolet light. Then diazofilm is developed in a solution of ammonia, while vesicular film needs heat only (to expand tiny bubbles of nitrogen gas that form the image).

Is there a difference between VDUs and VDTs?

In these guidelines, visual display units (VDUs) and visual display terminals (VDTs) are terms used interchangeably - they refer to machines which display information electronically. Amazingly, some Australian employers are insisting that there is a difference between VDUs and VDTs, and that rates of pay for working them should be different! For example, in the newspaper industry, the Regional Dailies of Australia Association and the Australian Provincial Press Association are claiming that VDTs are terminals which are on-line, while VDUs are terminals which stand alone. They have adopted the position in negotiations with the Printing and Kindred Industries Union (PKIU) that VDU operators should have a lower rate of pay than VDT operators. It needs to be stated categorically that this distinction is a figment of the imagination of the newspaper proprietors; whether the information displayed on the screen is generated directly at the keyboard (a stand-alone terminal) or is transmitted from somewhere else (an on-line terminal) is entirely irrelevant to the operation of the terminal.

HEALTH EFFECTS OF SCREEN BASED EQUIPMENT

A conspiracy of silence surrounds the potential and proven adverse health effects of screen-based equipment, particularly electronic data entry and visual display terminals. One body after another, such as the Royal Australian College of Ophthalmologists and the National Health and Medical Research Council, mouth the refrain that 'there is no evidence of permanent visual or ocular damage resulting from the use of VDT's. What this carefully worded statement means is that:

1. the likely damage has not been investigated yet in any long-term study of VDT operators;

2. suspected permanent effects, such as cataracts of the lens of the eye, have not been 'proven' or upheld in court proceedings (although it is worth noting that in 1981 the widow of a telephone technician working with microwave television relay equipment in New York was awarded compensation for his death - see below);

3. a host of non-ocular effects, such as repetitive movement injuries, postural fatigue, severe skin rashes ('VDT sunburn') and possibly miscarriages and birth deformities have all been associated with VDTs.

It is the same as in the field of toxic chemicals and cancer, where workers over the years have been treated to a litany of assurances that chemical X is safe, that "we have no knowledge of anyone dying from cancer when handling this material" - when a follow-up study of people who have gone on to different work and subsequently died may reveal that an alarming proportion of them died from cancer.

The principal health problems associated to date with work on screen-based equipment are:

1. cataracts of the lens of the eye - arising from non-ionising radiation;

2. eyestrain and short-sightedness - arising from screen characteristics and the visual environment;

3. backache and muscle fatigure - arising from poorly designed workstation, poor working environment and stressful work design;

4. repetitive movement injuries of the fingers, hand, arm and shoulder - arising from excessive keystroke rates;

5. depression and neurosis - arising from poor system and work design;

6. possible miscarriages and birth deformities and face rashes - arising from ionising radiation emission and electrical discharge.

1. Cataracts

A cataract is a cloudy or opaque discolouration of the lens of the eye. It is perceived by the victim as a dimming of sight, and can proceed to complete blindness. The extent of sight loss depends on the density of the cataract, and its size. Cataracts can be congenital, that is present from birth, or they can develop through disease processes (eg diabetes) or through trauma or simply through the wear and tear of age (so-called 'senile cataract'). Cataracts are irreversible, and the only 'treatment' is surgical removal of the clouded lens and then correcting vision with contact lenses or bifocal spectacles or other optical aids.

One of the most controversial traumas giving rise to cataracts is radiant energy - as emitted from VDTs for instance. To date, at least 16 cases of cataract have been linked with the use of VDTs and related electronic display systems.

Dr. Milton Zaret, clinical associate professor of ophthalmology at New York University's Bellevue Medical Centre, has been the foremost exponent of radiant energy cataract. He diagnosed the first case of VDT cataract in a US radar technician in 1969, as one of 42 cases of microwave cataract reported by Dr. Zaret to the Annual Meeting of the Aerospace Medical Association in that year. He was then involved as consultant to two sub-editors on the New York Times who developed cataracts after working with VDTs for a year, in 1977, and was retained by the men's union, the Newspaper Guild of New York, in the celebrated

arbitration proceedings that ensued. This case is reported in full as Case Study number 3 below. Dr. Zaret disclosed details of a further seven cases of VDT cataract when speaking to a conference on the health hazards of VDUs at the Loughborough University of Technology, England, in December 1980.(10) These cases were:

(1) a 49 year old newspaper woman who developed radiant energy cataracts in 1979 after working with VDUs for 6 months.

(2) a 53 year old female office worker who developed cataract in the right eye in 1980 after working with VDUs for four years. She had had X-ray therapy of her face for acne when she was 16 years old. According to Dr. Zaret, this indicated that her recent exposure to VDU radiation was a contributory cause in bringing about her cataract, after the lens of her right eye had been sensitised by the X-rays in her youth.

(3) a 33 year old male with only one eye and very severe myopia (short-sightedness) who developed a cataract in 1980 after working with VDUs constantly between 1977 and 1979 and intermittently thereafter;

(4) a 44 year old female office worker who developed incipient cataract in one eye in 1980 after working with VDUs for 3 years (15 months earlier she had contracted a bizarre illness starting with partial loss of hearing in one year, a singing in the ears, loss of balance, and loss of pupillary reactions, for which no cause could be found);

(5) a 54 year old male air traffic controller who developed cataracts in 1976 after prolonged viewing of radarscopes from 1948 (and whose deteriorating vision after 1967 resulted in his 'losing' aircraft on the screen and causing near collisions on several occasions);

(6) a 42 year old female computer programmer who developed an incipient cataract in 1980 after working full-time with a VDU for five years (she had noticed a gradual difference in colour sense between her two eyes, which was worse when she was working on the screen);

(7) a 27 year old male air traffic controller who developed incipient cataracts in 1980 after having worked with radarscopes since 1969.

This last case was the subject of a vicious cover-up by his employers, the US Federal Aviation Administration, who were clearly getting worried about the number of microwave and VDT cataract cases turning up in their employment.

The other cases of VDT cataract were reported by the president of the Newspaper Guild of New York, Charles Perlik, in testimony before a US House of Representatives sub-committee hearing in May 1981. The most recent case had been a 25 year old wire-service employee who had no family history of early cataracts and was not a diabetic.

Radiant energy encompasses sunlight, ultra-violet light, infra-red light, microwaves and radiofrequency waves used for broadcasting by radio stations around the world. These are all parts of the electromagnetic radiation spectrum. Electromagnetic radiation has been known to cause cataracts for over a century. One of the best descriptions of the process by which this occurs was given by Sir Stewart Duke-Elder in a paper published in 1926, described as a "brilliantly prescient manuscript" by Dr. Zaret at Loughborough in 1980.

The lens of the eye is made up of proteins strung out and contained within a capsule. It's rather like the white of an egg - and everyone knows what happens

to that when the egg is heated. The protein coagulates, and turns opaque. Roughly the same sort of thing happens when the lens of the eye is exposed to excessive radiant energy - except that the effect is not through heating, but through other forms of energy exchange. Duke Elder described the process of cataract formation as a first stage of denaturation followed by a second stage of agglutination. Since then there has been extensive investigation into the biochemistry of cataract formation, much of it being carried out by Dr. Bob Augusteyn and colleagues at the Department of Biochemistry at the University of Melbourne.

The lens of the eye has no blood vessels and no nerves feeding it. This has the trivial implication that the lens can be cut without pain and without loss of blood - but the serious implication that it cannot regenerate after being injured. That is why the denaturation of the protein we call a cataract is irreversible.

Why then are cataracts linked with Video Display Terminals? Because VDTs are known to emit electromagnetic radiation.

Some surveys of VDTs have revealed relatively high levels of radiofrequency emission. (The current US standard is 10 milliwatts per square centimetre; there is no standard in Australia.)

(1) Tests at two New York newspapers in 1979 found readings as high as 15 milliwatts and 40 milliwatts on the Teleram model 2277 VDT. This model has since been modified to incorporate shielding (which was previously claimed to be unnecesary).

(2) Tests at the Montreal Gazette in January 1981 found readings in excess of 20 milliwatts per square centimetre on the Sperry/Univac UTS 400 model VDT. These figures were found in 15 out of 29 units tested. The radiofrequencies detected were in the extremely low frequency range, not covered by US or Canadian standards. It was also found that these energy levels (strictly, power density levels) were reduced when a makeshift aluminium foil shield was placed around the units -indicating that metal cabinets are better than plastic from the point of view of shielding electromagnetic radiation.

(3) More recently the US Bureau of Radiological Health reported tests of VDTs for RF emissions, and found consistently high readings from two models - the Ontel and Teleram units. Because these readings were mostly in the extremely low frequency range as well, they were dismissed as having little biological relevance.

Comment: Affiliates are advised that there is currently a great deal of concern being expressed over the health effects of low levels of eletromagnetic radiation, emitted not just from VDTs but also from radiofrequency sealers and heaters used in industry, from diathermy units, microwave transmitting stations, as well as from such traditional sources as kilns and furnaces (glass-blowers' cataract was recognised in the nineteenth century). This problem is becoming so serious that Guidelines on Electromagnetic Radiation will be issued for ACTU and VTHC affiliates in the near future. In the meantime affiliates are advised to regard all parts of the EM spectrum as hazardous - including the extremely low frequency radiowaves emitted by VDTs.

Surveys conducted by the Bell Telephone Laboratories on a range of terminals, and by the US National Institute for Occupational Safety and Health on newspaper VDTs in San Francisco and Lexington (13) reveal significant levels of radiation emission in the near-ultraviolet region of the EM spectrum. NIOSH found that eleven terminals emitted from 0.06 to 0.60 microwatts per square

centimetre. This is three or four orders of magnitude less than the current US standard of 1000 microwatts per square centimetre for this region of the EM spectrum - but as noted above the standards are subject to a great deal of controversy, and much lower standards have long prevailed in the Soviet Union and some eastern European countries.

A paper published in the June 1979 issue of Wellcome Trends in Ophthalmology reported the cases of three dental workers, aged 48, 34 and 26, all of whom had been exposed to low levels of ultra-violet radiation and who developed cataracts. Dr. Zaret maintains that these dental workers must have been exposed to UV emission levels comparable to those recorded by Bell Telephone Laboratories and NIOSH. (See the forthcoming book by Tony Wells, VDTs: Innocuous or Insidious (14), for details.)

The upshot of this evidence - the cataracts found by Zaret and others in a significant number of VDT operators and which can not be explained by any other causal mechanism than radiant energy, and the findings of detectable and sometimes high readings of ultra-violet and radio frequency and microwave frequency radiation being emitted by VDTs - is that cataracts must be considered a health risk of VDTs. This is not to say that they are likely to be common - although NIOSH in their 1980 California survey found that 1 in 100 VDT operators reported diagnosis or treatment of a cataract within the previous 5 years, whereas there were no cases amongst non-VDT operators. (6) But they are a hazard, and affiliates with members exposed to VDT screens should be aware of this.

Tests are quoted above which indicate that metal shielding around the body of the terminal reduces EM radiation emission. Glass screens placed between the terminal and the operator are also available, to absorb ultra-violet light. Some employers, when faced with a 'UV radiation scare', might offer employees sunglasses. Needless to say these are not recommended - firstly because recent tests have shown that even polaroid sunglasses are inefficient absorbers of ultraviolet light, while some of the cheaper sunglasses actually increase the amount of ultraviolet radiation getting to the eyes, and secondly because provision of glasses is a means of putting the problem of radiation emission back onto employees, making them personally responsible for reducing their exposure - whereas it should be the employer's responsibility to reduce exposure levels at source.

Since cataracts must be considered a hazard of VDU use, affiliates are justified in demanding ophthalmological or optometrical eye examinations for their members, both before starting work on a VDU, and at regular intervals thereafter. This is an important demand, and one that has not hitherto been pursued by many unions. The ACTU has been advised that the demand is both reasonable and realistic, given Australia's ophthalmological and optometrical resources. Eye examination should always include slit-lamp biomicroscopy of the lens.

(ii) Visual problems

VDU operation can be a more potent source of visual discomfort that conventional paper handling for a number of reasons.

- There may be reflections on the screen from inappropriate room lighting or from windows and these reflections are a potent source of annoyance.
- Normal lighting can become a source of glare when someone is working on a dark screen.

- Poor character design or flicker may lead to strain in trying to read the text displayed on the screen.

In the case of microfiche readers, the situation can be even worse.

- The image may be blurred due to poor focussing control;
- The screen may be insufficiently illuminated, or illuminated in patches (with a 'hot spot' in the centre of the screen);
- The image may wobble, as when someone walks past the reader, or the images flash past as you look for the right frame on a fiche or film. Both these characteristics give rise to a sensation akin to sea- sickness.

But even with the best VDT or microfiche reader, there will still be eyestrain problems resulting from close visual work. The problems referred to above merely exacerbate the strain.

'Eyestrain' is a difficult thing to pin down. Since coming into widespread use with the advent of VDUs, the term has been frequently derided by doctors as being meaningless. 'Visual discomfort' is a term that seems more acceptable.

At least two factors are involved in visual discomfort. One is a temporary strain on the muscles of the eyeball, known technically as asthenopia. This occurs because our eyes have evolved to focus easily on distant objects 'at infinity'; in this state the eyeball muscles are relaxed. When you focus on a near object, the eyeballs have to be turned inwards, creating tension in the inner eyeball muscles. If prolonged (say, for over 1 hour or 2 hours work) this tension gives rise to a burning sensation, headache, fatigue and ultimately double vision (when co-ordination between the two sets of muscles fails).

A large screen viewed from a distance is easier on the eye muscles than a small screen viewed up close.

The other factor is temporary short-sightedness, known technically as accommodative spasm, and referred to by Ramazzini in 1700, but frequently ridiculed as a figment of people's imagination by doctors.

Many attempts have been made to find objective criteria of visual fatigue, employing for example measures of reading rate and comprehension, eye fixations and regressions, pupil diameter, blink rate, dark adaptation time, etc. But a Swedish researcher and associate of the White Collar Union Federation of Sweden, Olov Ostberg, has shown that measurement of the refractive power of the eye, using an ingenious laser set-up, is currently the best index of fatigue.(7)

This work using laser optometry has now settled the question: there are detectable effects on the accommodating power of the eye after working on a VDU.

These effects may be characterised as fatigue of the muscles that change the shape of the lens in the eye. When viewing a distant object, the lens is thin, and the muscles relaxed; to view a near object, the ciliary muscles constrict and the lens adopts a more spherical shape.

But two other important factors need to be considered when discussing VDU eyestrain.

(1) The eyestrain may be a symptom of poor posture and aching muscles elsewhere in the body e.g. stiff neck or shoulder or aching back. It is now

generally accepted that these postural problems lie behind many of the early complaints of 'eyestrain' associated with VDUs. Hence eyestrain will be reduced by paying due regard to the ergonomics of the VDU workstation - discussed below.

(2) The eyestrain may be a symptom of an uncorrected visual defect which has only become apparent as a result of working on a VDU. Unfortunately, defective vision is common, even among young adults, and tends to become the rule rather than the exception after the age of 40 years. Neither does the wearing of glasses necessarily mean that poor sight has been corrected. A study quoted in the VDT Manual(16) found that from a sample of 500 clerical and administrative workers, 50% had defective vision and 37% of the spectacle-wearers needed a new prescription; 69% of the non-spectacle wearers required positive correction.

Hence it is important that VDU operators have eyesight tests provided by the employer before starting work, and at regular intervals thereafter. This is to pick out those individuals who have developed a visual defect that needs correction (i.e. they need a pair of glasses) or whose glasses need a new prescription because their eyes have further deteriorated.

There is no assumption in this that the visual defects are caused by the VDU -but working at a visually demanding task with an uncorrected visual defect is sure to lead to 'eyestrain' and certainly to neck and shoulder pain as you peer at the screen to make out the fuzzy characters.

The Royal Australian College of Ophthalmologists has considered the question of eyesight tests for VDU operators, and has advised the NH & MRC that: "There is no particular need for VDU operators to have eyesight tests any more often than, or differing from, other clerical workers." This echoes a similar position adopted by the Employment Medical Advisory Service (EMAS) in the UK in 1980. Those opinions can only be dismissed as excessively conservative, and not based on any real understanding of the visual demands of prolonged VDU work.

To repeat: eyesight tests are not a protection against poor lighting or other environmental or postural factors in causing eyestrain, nor are they based on an assumption that the VDU is damaging your eyes. They are simply a prudent means of ensuring that anyone who is required to perform the visually demanding work of operating screen-based equipment should have any visual defects corrected. Because the employer sets the visually demanding work, the employer should be required to pay for the eyesight tests.

Note: Virtually all visual defects can be corrected by suitable spectacles, so eyesight tests should not be used to 'screen' out 'unsuitable' VDU operators, particularly people over 40. With properly corrected defects, a short-sighted, long-sighted or any other sighted person is perfectly capable of operating a VDU.

A package of eyetests has been put together by a group in the UK called the VDT Advisory Group, and this package has been adopted and recommended for use in Australia by the NH & MRC in Occupational Health Guide ... Eyetests for VDT operators. This package of tests is endorsed as being a suitable pre-employment and regular screening package to check eyesight.

Note however, that this package does not include any direct examination of the eye by an opthalmologist or optometrist. This direct examination is recommended to all affiliates as an indication of possible cataract formation. The testing of eyesight (which is basically the concern of the employer to ensure efficiency) should not be confused with the examination of the eyes (which is basically a health issue of interest to the owner of the eyes).

Note too that many union members will be justified in demanding that the employer provide spectacles for VDU work that are prescribed as a result of eyetests. Most spectacles are prescribed for near point and distant vision, and the normal viewing distance for a VDU falls in between these. The VDT Manual (p.217) notes that: "If they (people with a visual defect) require special prescriptions specifically for VDT work then it seems reasonable that they should be provided by the employer." This opinion is endorsed.

Finally it should be noted that none of the above work (the study of asthenopia of the eyeball muscles and the accommodative spasm induced by close work at a VDU) nor even the regular monitoring of operators' sight by means of a package of tests, answers the question: Do VDUs have a long-term effect on the eyes?

The answer to this question is not known, and can only be discovered by setting up suitable long-term studies. To date, neither the NH & MRC nor any company has been willing to fund such a study in Australia. In the meantime the APTU and eight other trade unions have sought the assistance of Professor Fred Hollows to conduct a study of the effect of VDTs on people's eyes. (15)

The need for such studies is stressed in the VDT Manual (p.216) and in the NIOSH research reports of 1981, where the phrase "the natural history of VDT ophthalmic pathology" is used - meaning, the (unknown) process by which a VDT damages the eye over time.

Until such studies are carried out, it is only prudent to ensure that members are not required to work full-time on a VDU, but should be provided with other work that takes them right away from the screen for at least half their working time. This demand for variety of employment is based firmly on the absence of hard data as to how VDUs affect eyes in the long run - and could be relaxed if data starts coming in showing that fears of possible long-term effects are in fact groundless.

To summarise, there are 3 key demands associated with the visual strain of VDU work. They are:

* regular breaks (of 15 minutes per hour for concentrated VDU work, and 15 minutes per 2 hours for less strenuous work) to allow the eyeball and ocular muscles to relax;

* variety of tasks, such that no more than half of working time is spent on the screen to minimise in advance any long-term problems that might emerge in the future;

* regular eyesight tests at employer's expense, to ensure that anyone with a visual defect can have it corrected by glasses suitable for VDU work.

(ii) Postural and work problems

A poorly designed VDU workstation can easily result in poor posture. The VDT Manual makes the point that good workplace design is not a luxury, but a necessary safeguard against discomfort and ill-health.

Some of the health implications of poor design of workstation and resulting postural problems are muscle over-loading syndrome and repetitive movement injuries.

A survey of data processing operators in the Tax Office in Melbourne has revealed an alarming level of repetition injuries and other occupational health problems.

The survey was undertaken by the Acting Medical Services Adviser to the Commonwealth Health Department, Dr. Alan Cumpston, as part of a joint management/union review.

Dr. Cumpston examined all 108 DPOs in the Tax Office, and found that 18 of them had or were suffering from repetition strain injury, and a further 22 showed evidence of muscular strain in the neck, shoulder, elbow or wrist and hand - i.e. 40 people, or 37% of the workforce, had observable occupational injuries. A further 46 women reported effects on their arms or necks as a result of data processing work.

In fact Dr. Cumpston found only 22 DPOs who had no work-related symptoms.

The survey justifies opposition by the DPOs, members of the Australian Public Service Association (APSA) and Federated Clerks Union (Tax Office), to management demands to increase their productivity, as measured by keystrokes per hour. The DPOs imposed a ban on performing more than 10,000 keystrokes per hour (which is the standard required for entry into the grade of DPO). At the time of the management demands, a quarter of the DPOs were off on compensation for repetition and related injuries.

Following the imposition of bans, Tax Office management agreed to the joint survey and a review of the whole question of workloads, productivity, keystroke counting and keystroke rates.

The dispute over productivity levels continues. (See case history below.)

This is not an isolated survey. Many others have been published in the literature. One particularly good study was conducted by the Department of Hygiene and Applied Physiology at the Swiss Federal Institute of Technology, Zurich, and report in 1981.(8)

This study looked at four workplaces: one with data-entry VDTs, one with conversational VDTs, one typing pool, and a control group of traditional office work. The sample comprised nearly 300 workers, about three quarters of whom were women. At the data entry terminals, work speed was high (12,000 - 17,000 strokes per hour) and full-time with right hand; the operators' gaze was directed mainly on documents which were lying on the table. (This is a situation which matches well with the Melbourne Tax Office prior to the bans on achieving the keystrokes per hour target). At the conversational terminals the work was involved with carrying out paying transactions for banks; operators worked with both hands, with their heads turned to the screen half the time, and to documents lying on the table for the other half.

Acute pains in arms, neck and shoulders were felt daily by the data entry VDT group, and in the lower back by the conversational VDT group, whereas the control group was virtually free of these. Amongst the data entry group, medical examination revealed tendomyotic pressure pains in shoulders and neck in 38% of operators; painfully limited head movability in 30%; and pains in isometric contractions of the forearm in 32%. Similarly high levels were found in the typing pool, and rather less in the conversational VDT work area.

These results were then matched against an analysis of the work areas. One common requirement of a VDT work station is an area to rest the hands and arms -and simple analysis revealed that at conversational terminals where the table was large, the hands and arms were frequently rested, thus reducing fatigue.

Operators at workplaces with movable terminals preferred visual distances of 45 to 80 cm. However, the longer the visual distance, the more the upper arms are lifted and the more marked the stretching of the arms becomes - and the greater is the importance of an arm-resting area. The lower the table and keyboard heights above floor, the more frequently were pains felt in shoulder, neck and arms. (This is a surprising finding, at odds with most of the recommendations of ergonomics. The author explains it on the basis that all documents were on the table. A document holder brings the line of sight up and improves the posture of head and neck).

A further study has recently been completed by the Australian Bank Employees Union, which commissioned an ergonomic survey amongst its members working in the computer entry section of the ANZ Data Centre, Melbourne. The report on this survey, completed by Mr. C. F. Teniswood of the Swinburne Institute of Technology, was completed in June 1981 and is currently under discussion between the ANZ Banking Group and the ABEU.

The Teniswood report found alarming levels of occupational injuries amongst ABEU members. The computer entry department has a staff of 141 persons, with around 90 staff being involved in keying tasks at one time or other. The computer entry workstations comprise six Honeywell VDUs and forty-eight Honeywell 716 keyboard stations. Each keyboard is fixed in position, and operated largely with the right hand. Trainees are expected to achieve a target keystroke rate of 10,000 strokes per hour at the conclusion of their training. Continued improvement thereafter is expected, with a target of 13,000 keystrokes per hour after 3 months, and 16,000 keystrokes per hour after 6 months. These targets were set as a result of a "productivity-improvement" study carried out by PA consultants in 1980. A group system of work was also introduced after this study; operators were allocated to groups in each shift, and the groups were encouraged to compete with each other.

There have been twenty cases of compensable 'tenosynovitis' amongst these operators since June 1977. Eight of these cases had less than one year's service. Even more horrifying, Teniswood found that 19 staff were injured at the time of his survey -that is 21 per cent of all operators, or 1 person injured in 5. These injuries are generally located in the right hand and arm, the right shoulder, and the surrounding neck region. Few injuries to the left arm have been reported. The injuries are categorized as tendinitis-tenosynovitis and muscle tenderness. Three operators have undergone the ordeal of carpal tunnel surgery - but without improvement in their condition. All injuries occurred after at least 6 months at work, i.e. after the 6-months target of 16,000 keystrokes per hour had been reached.

(iv) Other effects

Persistent reports link VDTs with other health effects, and pending more complete investigations these effects cannot be dismissed.

In the past four years, there have been at least seven reported clusters of miscarriages and children born with deformities amongst women working with VDTs in Australia, the US and Canada.

* In February 1978 it was announced that four women had suffered miscarriages after working with VDTs at a city branch of the Bank of Adelaide. The South Australian Health Commission carried out tests and announced that the machines were safe. This survey was followed up by a survey of VDTs for x-ray emission by the Australian Radiation Laboratory. ARL issued a special information bulletin in 1978 stating that no detectable x-ray emissions had been found.

* Four out of seven pregnant VDT operators in the classified advertising department of the Toronto Star gave birth to children with deformities between May 1979 and May 1980. The deformities were a club foot, a cleft palate, an underdeveloped eye, and multiple heart abnormalities. The Ontario Ministry of Labor checked all 296 terminals at the Star at the request of the Southern Ontario Newspaper Guild. According to the Ministry's report, no power densities greater than 0.05 mW/cm^2 were detected in the microwave range. The Star investigation is continuing, and the Guild is negotiating for the option of non-VDT work for pregnant women.

* There were 7 miscarriages and 3 cases of severe birth defects out of 15 pregnancies between October 1979 and October 1980 at a Defence Logistics Agency regional contracting office in Marietta, near Atlanta, Georgia, USA. An investigation by the US Army Environmental Hygiene Agency in February 1981 could not find a cause for this cluster : it termed the birth defects an "unusual statistical event". All of the women concerned had worked on VDTs, from full time to a few minutes a week.

* There were 7 miscarriages and a premature infant death out of 12 pregnancies between May 1979 and June 1980 amongst women working at the Sears, Roebuck mail order house's computer centre at Dallas, Texas. An investigation by the Abortion Surveillance Branch of the US federal health agency, the Center for Disease Control, could not identify a common factor explaining the 8 adverse outcomes. Two of the women in the computer centre worked full-time on terminals.

* Over the two years between February 1979 and February 1981, seven out of 13 pregnant employees at Air Canada's check-in counter at Dorval Airport miscarried. The women's union, the Canadian Air Line Employees' Association (CALEA) surveyed the women at Dorval, Montreal, early in 1981, and requested radiation tests. These were turned down by the Department of Health and Welfare and Labor Canada, but at the union's insistence the Canadian Standards Association eventually checked for x-rays and found non detectable ionizing radiation being emitted from the 26 VDTs tested.

* In 1980-81, a total of 10 out of 19 pregnant women working in the Ontario Ministry of the Attorney-General in the Old City Hall, Toronto, Canada, had miscarriages. Four of the pregnant women worked in an office with two VDTs. This cluster of cases has received national television coverage in Canada, and is the subject of an investigation by the Ontario Ministry of Health and by the Ministry of Labor checking the VDTs for radiation leaks.

* During the last three years, 7 out of 8 pregnancies among workers at the solicitor-general's office in Ottawa, Canada, have ended abnormally. Four women have miscarried, two babies have been born with respiratory diseases, and one was born two months prematurely. All seven women worked on VDTs. The eighth woman who gave birth to a healthy baby did not work on a VDT. The union representing the women, the Public Service Alliance of Canada, has requested an independent inquiry into this cluster.

These clusters of miscarriages and birth deformities and other adverse reproductive outcomes do not prove anything - but they certainly signal a cause for concern, and point to the need for :

1) more accurate monitoring of reproductive outcomes of VDT workers;

2) the need for VDT manufacturers to make zero radiation emission one of their design criteria; and for unions to insist on radiation emission ratings from VDT suppliers prior to purchase.

Other puzzling health effects reported amongst VDT users include facial rashes, or 'VDT sunburn', reported in Norway and the U.K.

Doctors in Norway notified the Directorate of Labour Inspectorate of about 35 cases of facial rashes during 1979 and 1980 (9). After dermatological evaluation 16 of these were found to be related to their working conditions at VDT workstations. Lighting conditions at work were excluded as a source of the 'sunburn'. Replacement of carpets with 'anti-static' floor covering led to improvements in some of the cases.

CASE STUDIES OF TRADE UNION ACTION ON SBE

Screen-based equipment provides an instructive example of the way trade unions can influence decisively the direction of technological change by intervening at the right time and in the right way. Whereas unions have great difficulty in tackling a noisy workplace, for example, where all the noisy machines are installed and management is reluctant to spend anything to alter the situation, they can exert influence when it is a question of buying a new machine, and at that point can impose their own noise standards (based on sound scientific advice) and contribute to making the future workplace less noisy.

With SBE, it is virtually always a case of the introduction of new technology, and in this situation the unions have maximum leverage. It was noted above that as soon as unions in the UK started to promulgate their own standards for terminal and workstation design in the late 70s, the manufacturers responded with alacrity, and were only too happy to promote their products as meeting trade union specifications.

Australian unions have been no less successful in stamping their imprint on the pace and direction of technological change. Three case studies will be examined here. One, involving the APSA and FCU at the Tax Office, has almost been resolved with full satisfaction of union demands. The second, involving several unions and Telecom, is still the subject of dispute.

The third concerns the actions of the US union, the Newspaper Guild of New York, in defence of its members at the New York Times when they developed cataracts.

1. Federated Clerks' Union and Australian Public Service Association : Data Processing areas in the Australian Taxation Office.

Grievances amongst the data processing operators (DPOs) in the various Australian Tax Offices goes back at least to 1979, when an occupational health and safety survey reviewed dissatisfactions, and noted that a number of DPOs were filing compensation claims for repetition injuries such as tenosynovitis.

Productivity targets for DPOs were set by management, and keystroke numbers were 'weighted' to produce overall target figures. The DPOs claimed that their workload was actually being increased as management reduced the 'weights' attached to their work. Finally the DPOs met in July 1981 and resolved that:

1. DPOs would work to a target of 10,000 actual keytstrokes an hour;

2. All operators would sign on with the same operator number;

3. DPOs would not work with seasonal or part-time staff;

4. DPOs would not work overtime.

This action prompted the setting up of a joint management/union review. The DPOs then lifted their overtime ban, but reimposed it in October when the joint review had failed to reach an agreement.

As part of the review, Dr. Alan Cumpston, Acting Medical Services Adviser to the Commonwealth Health Department, was called in by management to survey the extent of repetition injuries in the Melbourne Taxation Office. Dr. Richard Taylor, research associate in the Department of Social and Preventive Medicine at Monash University, was called in by the unions. As it turned out, Dr. Cumpston's report was so damning that it was adopted by the unions as well. As noted above, Dr. Cumpston found that of 108 DPOs, 18 had frank repetition strain injuries, and a further 22 showed evidence of muscular strain in the neck, shoulder, elbow, wrist or hand. A total of 40 women, or 37% of the workforce, had observable occupational injuries.

Dr. Cumpston recommended that 12,000 actual keystrokes an hour should be an absolute ceiling.

Also as part of the review, the unions (FCU and APSA) conducted an ergonomic analysis of the Tax Office. A total of 34 operators (chosen randomly) were interviewed at their workstations on 11 August, 1981, using an APSA checklist. This review resulted in the formulation of 17 recommendations to improve the ergonomics of the Tax Office.

The joint review team finally issued its report in November, with 27 specific recommmendations concerning:

- physical layout and organisation of the Tax Office;
- keying performance (a maximum of 12,000 keystrokes per hour);
- keying time;
- work allocation/rotation of duties;
- promotion, higher duties and proficiency allowance;
- DPO statistics (weighted character and productivity indexes to be abolished, and keying performance to be reported on only in terms of actual characters per hour);
- workers compensation (what 'light duties' DPOs with diagnosed repetition injuries are to be assigned);
- ergonomic matters.

All the recommendations were accepted by the Commissioner for Taxation, with the exception that a weighting system for producing productivity indices was still insisted on (but based on positive rather than negative weights).

However the implementation of many of the recommendations is taking time, and is subject to Government interference. Until the workplace is actually changed in accordance with the ergonomic recommendations of the working party, the DPOs are maintaining their ban on keying more than 10,000 strokes per hour. The position of the FCU and APSA is that a rate of 11,000 keystrokes per hour will be acceptable when the workplace has been made to conform to ergonomic requirements.

The FCU is considering bringing a common law compensation action against the Taxation Office.

The lessons of this dispute are clear. The DPOs, members of the FCU and APSA, have taken a principled stand in favour of an improvement in their working conditions, based on the appalling levels of injury uncovered by Dr. Cumpston. There has been no mention of trading improvements in conditions for a 'disability allowance'.

One of the most important spin-offs of this dispute has been the prompting it has given to the Public Service Board to issue its own management guidelines on screen-based equipment (reviewed below).

Full copies of the Tax Office reports:

1. Dr. Cumpston's report;
2. FCU/APSA ergonomic review;
3. Joint management/union Tax Office review,

are available from the FCU, the APSA, and the ACTU/VTHC Occupational Health and Safety Unit.

2. Screen-based equipment at Telecom

Telecom is Australia's largest employer, and a large user of visual display terminals. It is therefore essential that the unions have an important influence over the manner in which VDTs are to be used in Telecom. This issue is the subject of current dispute.

The Telecom unions, comprising the APTU, ATEA, ACOA, ATPOA, ADSTE, POA, UPT and APSA formed themselves into a Joint Telecom Unions Working Party in 1980, following Telecom's publication of draft Occupational Health Safety and Ergonomic Guidelines on VDTs. The TUWP objected to several points in the Telecom Guidelines, and held that important areas were omitted. A redrafted version of the Guidelines was submitted, and discussions held in September 1981.

The main areas of disagreement were :

* The TUWP did not accept Telecom's eye and eyesight testing programme, which did not go beyond the requirements of the NH&MRC Occupational Health Guide Eye Tests for VDU Operators. The TUWP made the counter-proposal that no further VDTs should be installed until an alternative eye testing programme emerged from completion of a study by Professor Fred Hollows (15).

* Telecom made no proposals on rest breaks, and the TUWP recommended breaks of 15 minutes every hour.

* In the absence of proposals from Telecom, the TUWP has proposed an ongoing programme of research on optimal working conditions for screen-based equipment, to be the subject of consultation between Telecom and the unions through a National Consultative Team.

* The TUWP recommended that VDTs installed should comply with the most rigorous of known world standards for non-ionising and ionising radiation, and that there should be a programme of ongoing monitoring and research on radiation emissions.

* In the absence of proposals from Telecom, the TUWP recommended that new screen-based equipment operators should have a training programme that included full information on the health aspects of SBE, such as the design of the equipment and the total workplace environment; the full range of adjustments available on office furniture; the importance of a healthy posture while working; and the nature and purpose of the eyesight testing programme.

These disagreements have not been resolved, and there have been no further talks between Telecom and TUWP on this issue. Telecom has gone ahead unilaterally and installed new terminals and VDTs without having reached agreement with the unions. The unions have objected to this, and the ATEA, for example, has applied work bans within Telecom in NSW and Queensland over the issues of work organization, ergonomics and the working environment, and eye examinations.

In the meantime the Trade Union Working Party has been carrying out its own investigations into the potential and known hazards of VDTs (and in particular into the effects of non-ionising radiation). Three projects have been announced in 1982. These are :

1) The APTU in co-operation with the ATPOA has been researching the effects of non-ionising radiation on screen-based equipment operators. This work now released in a document VDUs and Ill-health - The Evidence (15), reports increasing health problems for operators as time passes and provides substantial medical and scientific evidence on the possibility of cataracts.

2) The APTU as a follow up to the findings of the report asked ophthalmologist Professor F. Hollows to conduct a study of the eyes of screen-based equipment operators. This study, using a different and more comprehensive series of tests, is drawing participants from ATPOA, AJA, ACOA, APSA, APTU. Professor Hollows' study is the first epidemiological ophthalmological study of its kind in Australia, and involves three groups of people in a double blind study. Results can be expected later this year.

3) The APTU, ATEA, ACOA, ATPOA, ADSTE, POA, CBOA, UPT, APSA have all co-operatively funded an independent scientific investigation carried out at Swinburne Institute of Technology into the "Potential Health Effects of Electro-magnetic Radiation Emissions from VDUs". This study takes a critical look at all previous studies, and is particularly critical of the NIOSH studies which totally discounted x-ray radiation as a potential problem. X-ray radiation has now been detected well above background levels in two separate overseas studies.

The Telecom Unions Working Party began negotiating with Telecom and the Australian Radiation Laboratory in May to conduct full measurements on a number of VDUs.

In May 1982 the TUWP reviewed the situation within Telecom, and adopted a position which :

"ACCEPTS the concluding remarks of the Swinburne study into the potential health hazards of electro-magnetic radiation from VDTs.

NOTES the reservations stated concerning the present incomplete state of knowledge of the biological hazards arising from electro-magnetic radiation.

RECALLS that many safety standards and maximum exposure rates for various biologically harmful radiations have historically been reduced as evidence accumulates from the deleterious health experience of occupationally exposed groups.

EXPRESSES concern about the lack of uniform standards in some areas of the electro-magnetic spectrum, their non-existence in others, the inadequacy and inavailability of tools to measure radiations.

The standards where they exist relate only to single, properly functioning screen-based equipment. There is some evidence that malfunctioning machines may be emitting much higher levels than is currently considered safe.

CALLS upon Telecom Australia to test all screen-based equipment for radiation both in the ionising and non-ionising range in the following instances - before and after installation, before and after repair and annually.

FURTHER CALLS on Telecom to introduce full ophthalmological testing of all persons required to operate VDTs prior to exposure and at regular 12-monthly intervals.

FINALLY CALLS upon the Standards Association of Australia to develop with Australian industry sensitive detecting equipment and safety standards which absolutely safeguard the user of screen-based equipment."

3. Cataracts at the New York Times

This section is based on material from the forthcoming book VDTs: Innocuous or Insidious? by Tony Wells, and on the Opinion and Award of the Arbitrator in the 1977 dispute between the New York Times and the Newspaper Guild of New York.

The New York Times converted to computerised type-setting, involving the use of VDTs for all writing, editing, sub-editing and layout work, in 1975 and 1976. By 1977, two sub-editors, Samuel Weiss and John Woodford, both in their early 30s, had been diagnosed as having cataracts in the lenses of their eyes. They were referred to Dr. Milton Zaret, clinical associate Professor of Ophthalmology at New York University's Bellevue Medical Centre. Zaret has been studying the effects of radiant energy on the human eye since 1952, and has become a scourge of the medical and scientific establishment. Zaret saw Weiss and Woodford in February 1977, and diagnosed incipient radiant energy cataracts in both men. The signature of radiant energy cataract, according to Zaret, is that it appears on the posterior capsule of the lens. The Times referred the men to its own consultant ophthalmologist, who concurred that the men had cataracts, but found that the cause was 'a mystery' in the case of Weiss, while in that of Woodford 'it might very well be a congenital problem' although the cataracts might be 'compatible with possible radiation exposure'.

At this point the trade union, the Newspaper Guild of New York, intervened on behalf of Weiss and Woodford, and demanded an investigation of The Times by the National Institute of Occupational Safety and Health (NIOSH). Weiss and Woodford were relieved of VDT duties pending the outcome of this investigation. NIOSH promptly carried out radiation emission tests on the VDTs - the Telco Model 40, the Harris 1500A and the Incoterm SPF 10/20 - and a physician reviewed the men's medical records. NIOSH measured ultraviolet (UV), visible, infra-red (IR) and radiofrequency (RF) emissions; no measurements of X-radiation were performed because NIOSH

claimed that previous surveys at The Times had failed to reveal detectable levels, and previous NIOSH studies of similar VDTs had been performed. NIOSH found that very little UV can be emitted by VDTs but detected no infra-red or visible radiation. For *radiofrequency radiation, either none was detected, or it was below the current safety* standard. NIOSH concluded: "... based on the above measurements, the current standards, and present knowledge of biological effects, the VDTs surveyed (and units similar to them) do not appear to present an occupational ocular radiation hazard".

In addition, NIOSH physician Dr. Jacqueline Messite, reviewed the men's medical records and found that their cataracts were: "compatible with those reported from exposure to radiant energy, but they are also compatible with those seen congenitally, or those associated with other etiologies .... Since the environmental investigation did not disclose any significant radiant energy emanating from the VDT Units, the etiology *of the cataracts remains undetermined*".

To put it mildly, this NIOSH report, delivered in May 1977, did not help the union's or the men's case. However their reaction provides an object lesson for all trade unionists. They combed the report, with the aid of Dr. Zaret, who was now engaged as a consultant by the union, and found that it was full of loopholes. What appeared to be a strong denial of their case was in fact a flimsy piece of whitewashing. Zaret attacked the study on the basis that it was carried out with inadequate testing devices (the measurement of electromagnetic radiation is fraught with difficulties); that emissions from malfunctioning machines were not measured (and such malfunctions were very *common in the Times' composing room*); that emissions from non-phosphor components, such as electrical oscillating circuits, were not measured; and that the sources of significant levels of radiation in parts of the building were not identified. Zaret also took issue with the medical conclusion.

The union refused to grant validity to the NIOSH study and referred the dispute to arbitration. At an initial meeting before the arbitrator, Maurice Benewitz, it was agreed that the union would propose a set of tests meant to determine as scientifically as possible whether radiofrequency emissions from the VDTs posed a health hazard. In this way the Guild took the initiative. Zaret proposed a methodology covering measurement of ionizing radiation *and all parts of the non-ionizing electromagnetic* spectrum - but after objections from the Times, insisted only on measurement of the key radiofrequency and microwave frequency parts of the spectrum. Measurements at the site of the operator's head, and with the machine in various operating modes, were spelt out (these points are taken up in the Workplace strategy section on radiation emission). The Times successfully objected to any tests that would cause damage to the VDTs.

Medical and engineering consultants acceptable to both sides were appointed by the arbitrator. The engineering consultants provided the services of an industrial hygiene firm, R. & B. Enterprises, which *presented a plan for measurement of RF and MW* radiation emissions in line with the Guild's recommendations, in August 1977. The plan involved exhaustive manipulation of the VDT controls to find 'worst case' combinations leading to maximum emissions. At each of these combinations, complete spectral scans were to be performed in the relevant frequency range.

The tests were performed in August, and a final report was made available to the arbitrator 5 weeks later. He in turn passed it on to a medical panel consisting of 3 men acceptable to both sides:

- Dr. David Coggan, Consultant at the National Eye Institute;
- Dr. Paul Henkind, Chairman of the Department of Ophthalmology at the Albert Einstein School of Medicine and at the Montefiore Hospital;
- Dr. Marvin Sears, Chairman of the Department of Ophthalmology at the Yale University School of Medicine.

According to the Arbitrator, all three medical consultants agreed that at microwave levels shown in the R. & B. report, the 'very high probability is that cataracts could not have been caused' by the Times' VDTs. However all the consultants prefaced their remarks with precautionary statements to the effect that medicine is an inexact science, and one of the consultants felt that the situation was so fraught with uncertainty that 'certain continuing precautions should be taken with regard to the VDT equipment and by individuals assigned to VDTs'. These were that:

1. The Times should carry out regular monitoring of RF and MW emission levels, to ensure that they do not rise significantly above those recorded by R. & B.

2. The fact that individuals work with VDTs should be reported in their personal medical histories. This would be useful in case further exposure to MW radiation were being considered, such as through diathermy treatment.

The arbitrator accepted these precautions, and directed that The Times should carry out regular monitoring, and that any evidence of higher emission levels should be rechecked immediately by more sophisticated equipment. If the higher levels are confirmed, The Times must take corrective action and inform the Guild fully of what was found and what was done.

The arbitrator delivered his judgment, finding that The Times' VDTs did not pose a safety hazard for employees, in February 1978. He left open the possibility of Weiss and Woodford seeking a further judgment in their own cases. The Times regarded this judgment as a victory, and directed the two men back to work on VDTs. Eventually Woodford resigned and moved to Detroit, but Weiss has remained at The Times. His vision has since deteriorated, according to Zaret's testimony before a US House of Representatives' sub-committee in mid-1981.

Since then the issue has not stood still. In March 1980 Zaret wrote to the Executive Vice-President of the Newspaper Guild telling him of further evidence that VDTs leak radiofrequency radiation. This was found in a survey conducted at Newsday, a newspaper based in Long Island, New York, in July 1979. Radiation as high as 15 *milliwatts per square centimetre - five milliwatts above the US standard* - was detected leaking from the top of two Teleram 2277 terminals. Zaret stated:

> "Although I still believe it is possible to correct what is wrong with VDTs, nevertheless, I no longer have any confidence that this will be done either properly or in timely fashion. Meanwhile, there is now what appears to me to be a clear and present danger to your members who are working with VDTs."

Early in 1981 the Newspaper Guild, in co-operation with the Mount Sinai School of Medicine in New York City (home of Dr. Irving Selikoff, of asbestos fame), announced an *extensive study into the health effects of VDTs. This study will be co-ordinated* with one being conducted by the Workers' Institute for Safety and Health (funded by the AFL-CIO) into the general effects of non-ionizing radiation. This Mt. Sinai study is designed to include ophthalmological examinations, radiation tests, a survey questionnaire for VDT operators, and possibly full-scale medical examinations. The study is expected to cover 2,000 workers, both VDT operators and non-operators to act as controls. It will look at individuals' past radiation exposure and their medical records. However the funding for this valuable study is uncertain.

Copies of the 1977 Opinion and Award in this case are available from the ACTU/VTHC Occupational Health and Safety Unit.

REGULATIONS, STANDARDS AND MANAGEMENT GUIDELINES ON SBE

The current upsurge in the use of SBE has alerted trade unions throughout the world to the potential and actual hazards associated with the new technology, and this in turn has prompted attention from regulatory and standards authorities, as well as from management organisations.

The first country to adopt national directives on VDU work was Sweden, with its publication of the 1978 Directive on Reading of Display Screens. The main points of the Swedish VDU Directives are as follows:

1. Ambient lighting must be suitably adapted. Special importance must be attached to lighting conditions at workplace where reading of display screens occurs regularly. Generally the illumination required is lower than in ordinary office work. In workplaces where work is continuously conducted at display screens, an illumination of between 200 and 300 lux may be suitable.
   Note: Lower illumination levels may be appropriate in certain working environments of a special nature (e.g. in monitoring air traffic control).

2. When ambient lighting is subdued as per point (1), supplementary lighting must be provided for other working areas near the display screens. Supplementary lighting must be adjustable and fitted with glare control arrangements.

3. Excessive differences of luminance if the field of vision produces what is termed contrast glare. The workplace should therefore be organized in such a way that the background of the display screen is of suitable luminance and the employee's field of vision does not include a window or any other glaring luminances. Bright reflections in the display screen are to be avoided.

4. The visual distance to the display screen and the angle of inclination of the display screen should be individually adjustable with due regard being paid to other ergonomic requirements. In the case of employees who wear spectacles, it is important that the optical correction is well adapted to the visual disease, and vice versa.
   Note: Ordinary spectacles for private use are often unadapted to the visual distance occurring in display screen work. Traditional biofocal lenses are unsuitable in many cases, because they often entail a strenuous work posture when used for display screen reading.

5. If an employee has a refractive error and incurs visual discomfort in connection with display screen work when using spectacles intended for normal purposes, the display screen must be moved to a position where the discomfort is eliminated. If this is not possible, the employer is to provide the employee with special spectacles which have been tested for display screen work.

6. If eye fatigue or visual discomfort tends to develop, the work must be organised in such a way that the employee can intermittently be given periods of rest or work involving more conventional visual requirements.

All of these points are endorsed and adopted in the ACTU guidelines offered below.

In Australia, there are no regulations or any other legal instrument covering the use of screen-based equipment, at either Federal or State level. However the Occupational Health Committee of the National Health and Medical Research Council (NH & MRC) has had the question under review, and an Occupational Health Guide on the Use of VDUs is currently under revision after being issued for consultation in 1981. An Occupational Health Guide on Vision and Eyesight Tests for VDT Operators has been available since 1980.

The NH & MRC Occupational Health Guides have no legal validity, but are seen as carrying the authority of the Commonwealth Department of Health.

No advice on the use of SBE by Commonwealth Government employees is offered by the series: Codes of Practice on Occupational Safety and Health in Commonwealth Government Employment. This is an omission which should be remedied.

Amazingly enough, there are no Australian Standards on VDUs or screen-based equipment. There is a standard on Guide to the Design of Microform Workstations (AS 2466-1981), and a general standard on Ergonomics in Factory and Office Work (AS 1837-1976) but this covers all factory and office work and the specific problems of SBE are not mentioned. Nor are there any international standards, from either the International Standards Organisation, or from the International Electrotechnical Commission. The ISO Technical Committee on 'Ergonomics' is currently preparing a standard on 'Visual perception in information processing', but this is a very general topic.

The plethora of trade union specifications for SBE should be seen in the context of this complete absence of guidance from the accredited standards authorities.

The Commonwealth Government's Department of Science and Technology has issued a volume VDUs at Work in its Occupational Safety and Health - Working Environment Series (No. 13 1981). This makes recommendations on:

- workstation;
- visual environment;
- other environmental factors.

Again this publication carries no legal weight, but is issued with the authority of the Department of Science and Technology. However it offers few specific recommendations. One of these is that:

- In areas exclusively used for VDU operation of the data enquiry type, an illuminance value of 200 lux will be sufficient .

The US authorities have also been slow to develop standards or regulations applying to SBE. All that seems to have appeared to date is a NIOSH Research Report, containing 5 pages of general recommendations. These cover:

- radiation testing;
- workplace design features;
- illumination (500-600 lux suggested); (Comment: These levels are far too high).
- glare control;
- work-rest regimens;
- visual testing.

On work-rest regimen, the NIOSH report recommends:

1. A 15 minute work-rest break should be taken after two hours of continuous VDT work for operators under moderate visual demands and/or moderate work load.

2. A 15 minute work-rest break should be taken after one hour of continuous VDT work for operations under high visual demands, high workload and/or those engaged in repetitive work tasks.

Unfortunately, NIOSH does not define what is meant by 'high' and 'moderate' workload.

Finally, a number of management guidelines on SBE have been issued. Of these, the VDT Manual is by far the best and most useful. Commissioned by the International

Research Association for Newspaper Technology, and first published in 1979, this is the most comprehensive account available of the technology of VDTs seen from the vantage point of its effect on the users. The Manual covers:

- VDT basics (CRT display, keyboard, radiation etc.);
- light, vision and optical characteristics of VDTs;
- ergonomic requirements for VDTs;
- ergonomic requirements for VDTs workplaces;
- health, safety and organizational aspects of working with VDTs;

and gives an ergonomic checklist for VDTs and VDT workplaces. The Manual's value lies in its comprehensiveness, and in its reference to controlled studies to back up each recommendation. Many of the VDT Manual recommendations are picked up in the ACTU guidelines given below.

In Australia, the Technology Research Unit of the NSW Government has produced a Guide to the purchase and establishment of word processing systems in the NSW Public Service. The Guide, published in August 1981 covers:

- selection and purchase of equipment;
- selection and training of staff;
- work organisation;
- health testing,

and includes recommended standards for VDU design and keyboard design.

On the question of rest periods, the Guide stresses that: "It is important that operators are able and are encouraged to take short breaks from VDU work through the day, in addition to regular lunch-time and morning and afternoon tea breaks."

In another significant development, the Public Service Board has recently sent a memorandum to all departments, statutory authorities and staff organisations, setting down guidelines on the Operation of visual display units (VDUs) and other screen-based equipment.

This memorandum is the outcome of lengthy negotiations between the Board and the APSA, in which stop-work action by ACT Branch members played a part.

The PSB Memorandum begins:

> "Approaches from Departments and staff associations have indicated concern by both management and staff about possible hazards associated with the sustained operation of VDUs and other screen-based equipment. Departments will be aware of the document prepared by the APSA (11) setting out its views on a number of aspects of screen-based equipment operation. The purpose of this circular is to provide information on sources of specialist advice on matters likely to affect the health and safety of operators, and to convey the Board's views on certain issues of concern to management and staff."

The Memo proceeds to discuss the three key areas of eyesight testing, rights to rest breaks, and proper working environment standards. On eyesight tests, the Board

adopts the guidelines issued by the National Health and Medical Research Council, namely that VDU operators should have eyesight tests:

- on commencement of work with VDUs;
- at two yearly intervals after the age of 40;
- whenever indicated by the onset of symptoms.

On rest breaks, the Board acknowledges that: "It is inevitable that sustained concentration will produce fatigue. Sound and sensible management would suggest that where possible, screen based tasks should be organized in such a fashion, that spells from concentrated activity at the display screen are available throughout the working day."

On working environment standards the Board recognises that proper attention needs to be given to furniture and equipment design, layout, lighting and other physical and social aspects of the work-place where screen-based equipment is used. In particular, the Board states that noise levels should be as low as possible, preferably 55 dBA for areas of high mental concentration, and 65 dBA for routine task areas.

The WA Department of Health and Medical Services has issued an (un-dated) guide on Visual Display Units. On 'rest periods', the Guide notes that: "Operators who work continuously with a VDU will find that it is desirable to rest their eyes after 1-2 hours of visual concentration." No bibliography is given, nor sources cited.

A particularly bad management guideline was produced by the Federal Department of Housing and Construction, in its Departmental Policy on Safe Use of SBE, issued as a consultative document in May 1981. This guide contained a perfunctory section on the general health hazards of VDUs; a section on visual fatigue that lumped together quite different causes of fatigue, and used US military phrases like 'task aversion'; a section on requirements to combat visual fatigue which again lumps together disparate sources of fatigue and bypasses any meaningful guidance by referring to, e.g. 'adequate illumination'; a section on eyetests that at least reproduces NH & MRC recommendations; and sections on purchase of SBE and working environment which are insufficiently detailed to offer any real assistance; and a final section on rest periods which is vague in the extreme. No mention was made of the need to prevent rapid movement injuries, nor of the undesirability of attaching productivity targets to work with SBE.

A revised draft of this departmental policy is expected in the near future.

A TRADE UNION STRATEGY AND CHECK LIST FOR VDU WORK

1. INTRODUCTION OF NEW TECHNOLOGY

VDUs are never introduced into an office, workshop or laboratory on their own, but as part of a system - a computerised office accounting system, a records system, computer-aided design etc. Similarly microfiche readers are introduced as part of a comprehensive miniaturization system.

The first point to consider is the overall effect of the introduction of the new technology on employment levels, job content, work satisfaction and work control, as well as on the health and safety of the membership.

Affiliates' attention is drawn to ACTU policy on technological change, adopted in 1979. This policy spells out that the ACTU is: "opposed to technological change which increases the mental and physical pressures on workers, and to production changes which demand more rigid requirements from the workers. Technological change should be aimed at improving the quality of work and the work environment."

The ACTU decrees that: "Unions should seek to challenge traditional managerial attitudes and prerogatives regarding consultation, notice and the right of termination, by seeking through award prescription or by agreement, obligations on employees to consult and negotiate from the contemplative stages on the various issues arising from technological change."

In accordance with this policy, Unions should seek to have as many aspects of the operation of the screen-based equipment agreed prior to its introduction, as possible. These aspects would include:

- variety of jobs for SBE operators;
- training of people using SBE;
- work breaks for SBE operators;
- refusal to negotiate 'danger money' for working with SBE.

Of these issues, the problems of job variety and 'rest breaks' are the most important. Too many employers have been allowed to introduce new screen-based systems which make half the workforce redundant and enslave the rest to a grinding screen-bound existence with all the medical problems entailed that are discussed above.

Many Australian unions already have a policy on this issue, such as the APSA: 'Members who operate SBE for continuous periods in excess of 1 hour per day are to be entitled to a rest break of at least 10 minutes duration over a period of 2 hours. Such breaks are to be in addition to those taken as a normal practice for meal or health reasons."(11).

Many unions, such as those in Austria and the UK, have campaigned to make 4 hours the maximum that anyone should work on a screen in a day.

Clearly, the policies on mix of jobs and rest breaks are related, and this is why they have to be settled prior to the introduction of the new technology.

Points to note:

1. Whenever possible, the introduction of VDUs should not be accompanied by the creation of a job category 'VDU Operator'. Jobs involving the use of VDUs should be spread around as much as possible. No-one should be required to spend more than half their working time on SBE.

2. Anyone who is required to use a VDU as part of their job should receive basic training in its operation, as well as an introduction to the health aspects of working on SBE, covering the reasons for eyesight tests and for regular breaks. Follow-up training should be provided as and when required.

3. Close work on SBE, whether a terminal or reader, involves the muscles of the eyeball and the ciliary muscles inside the eye, in continuous contraction and regular breaks are required to allow them to recover: If the category 'VDU operator' has been created, then work on the screen can be assumed to be continuous and heavy, and a rest break of 15 minutes after every hour can be demanded. If however the VDU work is just one of several tasks, then a break after two hours is required - and this need not be a 'rest' break but a change of duties. Of course, normal rest breaks for meals and tea or coffee would still apply, and a period of 5-10 minutes quick rest after 1 hour would be desirable.

   The point is that it is far better to have a mix of jobs, only some of which require work on the screen, than to have a series of breaks away from a screen-based job.

4. Introduction of SBE to the workplace requires negotiations over a range of working conditions, work loads etc. The negotiations should never be circumvented by agreeing to a few extra cents per hour for working with SBE. This is in accordance with ACTU policy on occupational health and safety, which states in para 7(ii) that "specific policies to be adopted by unions should include as a first priority the elimination of workplace hazards or dangers and the refusal to accept payment for adopting hazardous or dangerous working practices."

2. SELECTION OF EQUIPMENT

Early trade union guides on the use and selection of SBE had a great deal to say on the visual characteristics of the equipment:

- height and width of characters;
- intercharacter and line spacing;
- screen size and luminance;
- image stability and flicker;
- display format;
- display coding;
- contrast control;
- colour of display

and the characteristics of the keyboard; such as keyforce, keytravel, and keyspacing.

It is not considered necessary to specify numerical criteria for these factors now, since this is already done at great length in such guides as the VDT Manual, and most of the original specifications have now been incorporated into new equipment. Besides, concentration on these numerical values has sometimes deflected attention from the basic ergonomic issues.

Hence the following general recommendations are offered. These are ergonomic criteria: they refer to the need for design of equipment to meet human requirements.

The main points to note are:

1. The image on the screen should be clear and stable.

2. It should be possible to distinguish easily between similar characters, such as 'O' and zero, C and G, I and l etc.

3. Contrast control should be available.

4. On microfiche readers, focus control should be within easy reach, and the screen should not have 'hot spots' of lighting.

5. Microfiche readers should have matt screen finishes to counter reflections.

6. The keyboard should be detachable from the screen; and set as flat as possible. By 1985, most keyboards should be in conformity with the new German DIN standard imposing a 30 mm thickness limit.

7. The VDT should have a fan to dissipate heat, but the combined noise of the fan and keyboard should not be such as to interfere with concentration. Machines which 'hum' should be rejected.

8. Impact printers should be separated from keystroking areas and sound-proofed.

9. Desks on which SBE is placed should be matt-finished, and of sufficient size to hold the screen, detachable keyboard, and documents comfortably. Desks or workstations which offer no room to rest hands or arms should most emphatically be rejected.

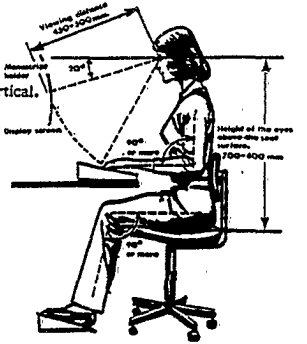
10. Desk height should be between 620 and 750 mm, and provide leg area that is free of obstruction, that is at least 700 mm deep, and at least 800 mm wide to permit unobstructed turning.

11. If the documents are suitable, document holders should be provided which bring the text up to a height where they can be read with the head inclined forward at 20^{0}, directly in front of the operator.

12. Chairs should be stable (preferably with a 5 point base) with adjustable seat height, seat angle, backrest height and backrest angle. The front edge of the seat should be padded to avoid cutting into the thighs. Gas-powered chairs are favoured.

13. The whole screen-based workstation should be set up to allow the operator to assume an optimum working posture:

- head inclined forward to an angle of 20^{0};
- spine slightly arched and forward leaning when seen from the side;
- upper arms vertical;
- no twisting of the head and trunk;
- thighs approximately horizontal;
- lower part of the legs approximately vertical.



Recommendation for a video display unit workplace, from a publication of the Commonwealth Department of Science and Technology

- Micromesh filters. These cover the screen with a mesh or network of tubes. Although they may reduce screen reflections, they suffer the drawback that they cut out screen images when viewed from some angles, and reduce the brightness of images.

- Etching the screen glass surface. The drawback here is that light from the images will be scattered, and again legibility will be reduced.

- Spray-on anti-reflection coatings. Again light is scattered by the coating, and character sharpness is reduced - to the extent that they sometimes have a 'halo'.

- Vapour deposited screen coatings. This is technically superior to a spray-on method, but is more costly.

- Thin film layers. Again this is technically superior but costly. It can only be applied to a glass panel which has then to be bonded to the screen. The filter is highly sensitive to dust and finger touch.

- Tube shields. This is a viewing shield placed around the screen, rather like the shields that early photo-graphers wrapped themselves in to keep out the light. Used in an office they create obvious problems of easy accessibility to screen images.

All the filters suffer from drawbacks, and it cannot be stressed too highly that the way to deal with reflections is not to fiddle with the screen, but to alter the environment - change the lighting, or block the windows, or shift the position of the VDU.

Another 'solution' to the problem of glare is for the VDU operator to wear dark glasses! This is seriously promoted by some companies. Needless to say it is not recommended - it is an extreme example of fitting the worker to the workplace, rather than the other way round.

Points to note:

1. The location of the SBE must be such that the screens and bench surfaces are not affected by glare and/or excessive light from windows or overhead luminaires. There should be no sources of glare, such as unshielded lights or windows, in the operator's field of vision.

2. The appropriate level of illumination for SBE is 150 - 300 lux.

3. Electrical cables should be located so as not to cross the work area, nor create a safety hazard.

4. Operators of SBE should be provided with an uncluttered and uniform view to rest the eyes, e.g. a curtained wall (a window as recommended by NH & MRC would be a source of glare, unless it is to the side of the operator).

5. Reflections and glare on the screen are normally an environmental problem, and can be solved by suitably modifying the environment e.g. by curtaining windows, and placing gratings across lights. Modifying the machine by placing filters in front of it, or modifying the operator by the use of sun-glasses, is not the way to solve the problem.

6. Local desk lighting to view source documents should be available as an option.

5. WORK DESIGN

It was noted above, in the discussion of postural health effects and rapid movement injuries, and in the case study of the APSA/FCU dispute in the Tax Office, that work design crucially affects the health and well being of VDU operators. This is nowhere more evident than in the area of setting productivity targets. Such targets are a source of stress and grief throughout industry, but particularly so in keyboard and screen work where machine pacing can exact a severe health toll.

Points to note:

1. Electronic SBE should never be allowed to pace or monitor the user. Some equipment offers this facility, and all such equipment should be rejected. Even if management claim that its introduction is benign, and merely offers workers feed-back on their average keystroke rates and error rates, one can never exclude the possibility that this information may be used as evidence in cases of discipline or dismissal.

2. The carrot that may be used is an incentive payment system, with bonuses for extra keystroking rates or lower error rates. Such payment systems should be emphatically rejected, for they can create unbearable stress in an operator who for one reason or another is falling behind.

3. If a minimal keystroke rate is set as a standard of entry to a particular grade, as is the case for data entry operators in the public service, then this standard should be checked on special machines at the time of entry only. Operators as a group of individuals should not be monitored to see that they regularly achieve the entrance qualification.

6. MEDICAL AND OPTICAL MONITORING

To prevent visual fatigue caused by uncorrected visual defects, and to monitor for incipient cataracts, all people required to work with SBE should have regular monitoring of their eyes and eyesight. This monitoring should be done by optometrists (formerly called opticians) or by ophthalmologists ('eye doctors'). These are professional people who have certain standards of competency to live up to.

Points to note:

1. All people required to work with SBE as part of their job should be provided with a full ophthalmological (eye and sight) or optometrical examination prior to starting.

2. Follow-up eye examinations using slit-lamp biomicroscopy should be provided at least every two years to check for cataracts.

3. Follow-up sight checks should be provided at least every 2 years. The package of tests should conform to those specified by the NH & MRC in Occupational Health Guide on Vision and Eyesight Tests for VDT operators, viz.:

   - distance visual acuity;
   - near visual acuity;
   - oculo motor co-ordination;
   - colour vision (where colour is part of the VDT)

(Note: that the NH & MRC Guide stipulates that tests should be repeated every 2 years only for those over 40, but this is rejected as too conservative).

4. Screening tests should be conducted at the workplace by a fully qualified optometrist or ophthalmologist (as distinct from the NH&MRC code, para 10, which only requires that the person be supervised).

5. Visual defects revealed by screening tests do not necessarily mean that the person is visually unsuited for VDT operation and under no circumstances should the screening tests alone be used as criteria for selection.

6. Costs of screening tests, professional consultation and the provision of any corrective glasses necessary for VDT operation should be borne by the employer.

7. To check that posture and workload are satisfactory, i.e. that no repetition injuries are being sustained, regular medical checks should be provided for people who spend over 25% of their time working on SBE.

RECOMMENDED ACTU/VTHC HEALTH AND SAFETY POLICY: SCREEN-BASED EQUIPMENT

1. Screen-based equipment - electronic video display terminals and other visual display units built around cathode ray tubes, and microform viewers - is coming into widespread use in offices, shops, banks, workshops, design centres and many other workplaces. Its introduction is largely in response to management and bureaucratic requirements, rather than in response to workers' needs; experience indicates that the equipment rarely improves people's working conditions, and can make them considerably worse. In accordance with ACTU policy on technological change, the introduction of screen-based equipment should not be opposed in itself. Affiliates should rather seek to impose their own standards and criteria to ensure that screen-based equipment is introduced in such a way that it does not increase mental or physical pressures on workers. If possible, it should improve the quality of work and the work environment.

   Screen-based equipment poses several risks to health, amongst which are:

   (1) cataracts of the eyes - arising from leakage of non-ionizing radiation;

   (2) eyestrain and short-sightedness - arising from screen characteristics and the visual environment;

   (3) backache and muscle fatigue - arising from poorly designed workstation, poor working environment and stressful work design;

   (4) repetitive movement injuries of the fingers, hand, arm and shoulder - arising from excessive keystroke rates;

   (5) depression and neurosis - arising from poor system and work design;

   (6) other health problems such as face rashes arising from electrical discharge, and possible miscarriages and birth deformities thought to be linked to x-ray emissions.

   No satisfactory long-term follow-up study of operators of screen-based equipment has been performed, and so statements to the effect that the equipment does not or cannot damage, e.g. eyes or eyesight, are without foundation. In the light of disastrous experiences associated with introduction of new technologies in the past, affiliates should regard screen-based equipment as a likely cause of severe health effects until it is shown to be safe.

2. The possilby detrimental effects of working with screen-based equipment can be minimised by ensuring that such work is organized according to the following principles:

   (1) The introduction of VDTs should not be accompanied by the creation of a job category 'VDT operator'. Jobs involving the use of VDTs and other screen-based equipment should be spread around as much as possible. No-one should be required to spend more than half their working time on a screen.

   (2) Anyone required to use screen-based equipment as part of their job should receive basic training, on paid time, to become proficient in its operation, as well as an induction into the likely hazards of the equipment, so that the reasons for regular eye and eyesight tests, for example, are understood. Follow-up training should be provided as and when required.

   (3) Close work on screen-based equipment, whether an electronic terminal or a microform reader, involves the muscles of the eyeball and the ciliary muscles inside the eye, in constant contractions and regular breaks are required to allow them to recover.

   (4) Electronic screen-based equipment should ordinarily never be allowed to pace or monitor the operator, such as for instance by logging errors or keystroke rates. Exceptions would arise for instance when job applicants are sitting proficiency tests.

   (5) By implication, incentive payment systems linking bonus rates to the number of keys stroked per hour or the number of errors committed should be emphatically rejected.

   (6) Screen-based equipment should be introduced on a small scale and always subject to ergonomic audit. Terminals should be grouped in small numbers; large rooms filled with rows of terminals should be rejected.

3. International and national standards associations and the regulatory authorities have failed to set standards or criteria which should be met by screen-based equipment if workers' health is to be protected. Under these conditions, it is imperative that affiliates impose their own standards, and a set of such standards, covering machine hardware, software, workstations and work environment, is given in an appendix to this policy. Due to the fast-changing nature of this technology, it is important that trade union standards keep abreast, or ahead of, the technology.

   Manufacturers' and suppliers' specifications should report whether machines satisfy ACTU/VTHC criteria.

4. When an organisation introduces new technology that incorporates screen-based equipment, affiliates should ensure that their members do not start work on that equipment until there has been:

   (1) a full ergonomic assessment of the equipment once installed;

   (2) a full environmental assessment of the working conditions;

   (3) a medical assessment of anyone likely to use the equipment.

   All efforts should be made before work starts to ensure that the workplace has been brought into line with the needs of the workers - rather than allowing the workers to be modified through the wearing of glare-shielding glasses or other protective equipment.

5. An ergonomic assessment should be carried out by an ergonomic consultant who is acceptable to both management and unions. The consultant's terms of reference should include:

   (1) checking that suppliers' specifications are in fact met;

   (2) checking that the workstation meets the ergonomic criteria spelt out in the appendix of this policy;

   (3) checking that the work design meets sound ergonomic criteria.

6. An environmental assessment should be carried out by an industrial hygiene consultant who is acceptable to both management and unions. The consultant's terms of reference should include:

(1) checking that the lighting meets the criteria spelt out in the appendix to this policy (concentrating in particular on eliminating reflections and sources of glare);

(2) checking that noise, heat, ionizing and non-ionizing radiation emission meet the criteria spelt out in the appendix to this policy.

7. A vision and eye assessment should be carried out by an optometrist or ophthalmologist who is acceptable to both management and unions. The medical assessment should include eye and eyesight examinations, as well as a general medical check.

(1) Eye examinations must include slit lamp biomicroscope examination of the lens to check for incipient or congenital cataracts.

(2) Eyesight examinations should conform to the package of tests as given in the NH & MRC Occupational Health Guide on Vision and Eyesight tests for VDT Operators.

(3) Eyesight defects revealed by these tests do not necessarily mean that the person is visually unsuited for VDT operation, for their sight can be corrected by properly prescribed glasses or contact lenses. Under no circumstances should the screening tests alone be used as criteria for employment.

(4) People already wearing glasses may have out-of-date prescriptions, or be wearing bifocals which are unsuitable for VDT work. They should be provided with proper prescriptions as if their vision were uncorrected.

(5) Costs of screening tests, professional consultants and corrective glasses or lenses suitable for VDT work should all be borne by the employer, as they are an essential pre-requisite for VDT and screen work.

8. Once screen-based equipment is installed, there should be regular checks on the equipment, working environment, and people involved, to ensure that major health problems do not arise.

(1) The equipment should receive regular maintenance and cleaning.

(2) The working environment should be monitored regularly for noise levels, heat and humidity conditions, and to check for ionizing and non-ionizing radiation emissions.

(3) Results of all environmental monitoring should be made available to the members involved and their union.

(4) Medical checks should be provided at least every two years for people who spend upwards of 25 per cent of their working time on screen-based equipment. This check should follow the same format as the pre-employment examination, and cover eye examination, eyesight tests, and a general medical examination to check for repetitive movement injuries or postural fatigue.

(5) Medical records will be held as confidential and their contents will not be revealed to management or unions without the explicit consent of the individual concerned. Individuals will always have access to their own medical records.

9. In accordance with the ACTU policy on occupational health and safety, affiliates are urged to regard as first priority the elimination of hazards or dangers associated with screen-based equipment, and to refuse to accept payment for adopting hazardous or unsafe working practices.

APPENDIX

RECOMMENDED ACTU/VTHC SCREEN-BASED EQUIPMENT CRITERIA

1. Machine Hardware Criteria

(1) Screen

(a) The image should be clear and stable.

(b) Characters should preferably be yellow against a dark green background, or green against a dark background.

(c) Characters should be clearly distinguishable from each other, such that,

- character width should be up to 80 per cent of upper case character height;
- the space between characters should be between 20 and 50 per cent of character height;
- row spacing should be at least equal to character height.

(d) There should be rolling and non-rolling display format.

(e) The dot matrix for characters should be at least 7x9, or preferably 9x14.

(f) Screen phosphors should be refreshed at least 50 or 60 times per second to control flicker.

(g) The screen should be glare-resistant.

(h) On microfiche readers, there should be no lighting 'hot spots'.

(i) Microfiche readers should have matt screen finishes.

(2) Keyboard

(a) The keyboard should be detachable from the screen.

(b) Keyboard should be slim, and preferably no thicker than 3 or 4 cm.

(c) The keyboard layout should be similar to that of typewriters, with special function keys conveniently grouped and marked, to conform with ISO 3243 (for alphanumeric keyboards) and ISO 3791 (for numeric keyboards).

(d) Keys should provide audible and tactile feedback, with volume control provided.

(e) Key caps should be concave (i.e. dished) and have a matt finish.

(f) The keyboard surround should be matt finished, and be fitted with a wide palm-rest along its near edge.

(g) The keyboard should be sloped, preferably at around 12° to the horizontal.

(3) Terminal

(a) The terminal should have a base that allows it to be tilted and rotated for maximum comfort.

(b) The casework around the screen should not be cluttered with controls.

(c) Casing should be metal or metal foil lined, to prevent emission of non-ionizing radiation.

(d) There should be a fan to dissipate heat, but its operation should be silent.

(e) The machine should not 'hum' when turned on.

(f) The wiring and electronics should conform to Australian safety standards.

(g) Noise power rating of machine in use should be less than 60 dBA.

(h) Ionizing radiation level at operator's position should not be detectable.

(i) Non-ionizing radiation level at operator position should be 10 times lower than current US standards within any frequency range (UV, IR, RF, MW etc.).

(j) Cables and leads should be secured and concealed.

2. Machine Software

(1) Programs for machine operation should be outlined in suppliers' specifications.

(2) Prompts, error messages and other diagnostics should be clear, concise and framed in good English.

(3) System crashes through operator error should be made impossible.

(4) Input and stored data should be protected from system crashes and machine failures.

(5) If several terminals share a common line or single computer, they should be able to operate independently.

(6) Programs recording operator characteristics, such as error rates and keystroke rates, are unacceptable.

3. Workstation

(1) Work surfaces should be of sufficient size to hold screen, keyboard, source documents, working paper and still leave room to rest the hands and arms.

(2) Work surfaces should be matt finished.

(3) Desk height should be between 720 and 750 mm, and provide leg area that is free of obstruction, i.e. at least 700 mm deep and at least 800 mm wide.

(4) If the documents are suitable (e.g. A4 sheets) document holders should be provided which bring the text up to just below eye level and in front of the operator.

(5) Chairs should be stable (preferably with a 5-point base) and provide maximum support without inhibiting the operator.

(6) Chairs should have adjustable seat height, seat angle, backrest height, armrest height and backrest angle.

(7) Chairs should be padded underneath the thighs, and should be upholstered in a fabric that breathes (i.e. not plastic).

(8) The whole screen-based workstation should be such as to allow the operator to assume an optimum working posture:

* head inclined forward at an angle of 20^{o}
* spine slightly arched and leaning forward
* upper arms vertical
* head and trunk not twisted
* thighs approximately horizontal
* lower leg approximately vertical.

4. Work environment

(1) Lighting

(a) The ambient illuminance should be between 150 and 300 lux.

(b) There should be no reflections from screen, keyboard or working surface.

(c) There should be no sources of glare in the operator's field of vision, such as uncurtained windows or intense lights.

(d) Luminaires should be fitted with prismatic or grid-type glare shields.

(e) The operator's field of view should be uncluttered and restful on the eyes.

(2) Room climate

The workroom should be air-conditioned, with temperature maintained between 21 and 23 degrees Celcius, and relative humidity between 45 and 55 per cent. (Filters and humidifiers in the air conditioning system should be regularly checked to ensure that they do not become a breeding ground for bacteria, and lead to diseases such as 'humidifer fever'.)

(3) Noise levels

(a) Noise levels should be kept below,

- 55 dBA in areas requiring concentration
- 65 dBA in areas not requiring concentration.

(b) Impact printers should be insulated and separated from keyboard areas.

GUIDE TO FURTHER READING AND DISCUSSION

1. The best introduction to the whole subject is provided by the VDT Manual, now published by Wiley as Visual Display Terminals: a manual covering ergonomics, workplace design, health and safety and task organisation (1980). (16)

The strength of the Manual lies in its excellent technical presentation of VDTs, and its ergonomic checklists for VDTs and VDT workplaces - but it shies away from making recommendations on some of the social issues like mixing tasks and taking work breaks. A copy of the Manual is available for consultation in the Unit, but affiliates likely to get involved with SBE issues are urged to purchase a copy for themselves.

2. Tony Wells, of the Australian Journalists Association, has recently written an excellent account of the introduction of VDTs into the newspaper industry in Australia. He provides a very readable summary of the debate over the emission of non-ionizing radiation from VDTs and its possible effects on health. This book is shortly to be published by the AJA. Under the title: VDTs - Innocuous or Insidious? (14)

3. The Australian Postal and Telecommunications Union recently published a provocative document entitled VDUs and ill-health: the evidence (15). This document reviews the evidence on emission of non-ionizing radiation from VDUs and its effects on people's eyes.

4. Useful background on ergonomics and VDUs is provided by the Proceedings of a conference on this subject held in Melbourne and then Sydney in September, 1979, hosted by The Ergonomics Society of Australian and New Zealand. The Conference Proceedings are edited by Barbara McPhee and Alan Howie, and are available from the Ergonomics Society, or from Dr. McPhee at the Commonwealth Institute of Health, University of Sydney.

5. Further useful background is provided by the proceedings of the Loughborough conferences on health hazards of VDUs, 1 and 2, held in December 1980 and March 1981. Contributions to these conferences were discussed above (8,9).

6. The Canadian Centre for Occupational Health and Safety, at Hamilton, Ontario, has published a useful guide to the burgeoning literature on VDTs, called VDTs: a selected biography (September 1981).

7. This burgeoning literature has now spawned academic journals as well. Of interest is a new journal Behaviour and Information Technology, whose first issue was published in Jan-March 1982, by Taylor and Francis, London. This journal is edited by Tom Stewart, one of the co-authors of the VDT Manual.

REFERENCES

1. Bernardo Ramazzini; De Morbis Artificium (Diseases of Occupations), Modena, Padua, 1700,1713. Re-issued by Hafner Publishing, New York/London, 1964.

2. M. Luckiesh and F. K. Moss, Fatigue of convergence induced by reading as a function of illumination intensity, American Journal of Ophthalmology, Vol. 18, p.319-323, 1935.

3. H. L. Zetterberg, The Working Life End-Users of Computerized Information, IBM Svenska, 1979 (quoted in Ostberg, see (7) below).

4. ASTMS, Guidelines on VDUs, 1978. Available from ASTMS Health and Safety Office, Dane O'Coys Road, Bishops Stortford, Herts, UK.

5. NH & MRC, Occupational Health Guide ... Vision and Eyesight Tests for VDT operators, 1980.

6. NIOSH, Potential Health Hazards of Video Display Terminals, 1981. Publication no DHHS (NIOSH) 81-129. Available free from Publications Dissemination DTS, NIOSH, 4676 Columbia Parkway, Cincinnati, Ohio 45226, USA. Include a self-addressed mailing label.

7. O. Ostberg, Accommodation and visual fatigue in display work. In E. Grandjean and E. Vigliani (eds), Ergonomic aspects of VDTs (Proceedings of International Workshop, Milan, March 1980), London, Taylor & Francis, 1980.

8. W. Hunting, Postural loads at VDT workstations, in Health Hazards of VDUs - 2, Proceedings of Conference held at Loughborough University of Technology, March 1981. Available from: HUSAT Research Group, Department of Human Sciences, Loughborough University of Technology, Loughborough LE11 1RG, UK.

9. J. Tjonn, Report of facial rashes among VDU operators in Norway, in Health Hazards of VDUs - 1, Proceedings of Conference held at Loughborough, December 1980. Available as above.

10. M. Zaret, Cataracts and VDUs, in Health Hazards of VDUs - 1, as in (8) above.

11. Australian Public Service Association (Fourth Division Officers), Policy on Screen-based equipment: occupational safety, health and ergonomic implications for operators, April 1980.

12. Australian Bureau of Statistics, The Labour Force, Australia, November 1980, Catalogue No. 6203.0, Feb. 1981. (From table 14, taking white collar workers as all employed persons in Professional, Administrative, Clerical and Sales categories.)

13. M. Weiss and R. Petersen, Electromagnetic radiation emitted from video computer terminals, American Industrial Hygiene Association Journal, Volume 40, April 1979, p.300-309.

14. T. Wells, VDTs: Innocuous or Insidious, in press.

15. Australian Postal and Telecommunications Union, VDUs and ill-health: the evidence, Melbourne 1982. Available from APTU Federal Office, P.O. Box 208, Carlton South, Vic. 3053.

16. A. Cakir and others, Visual Display Terminals : a manual covering ergonomics, workplace design, health and safety and task organization, Wiley, 1980.

NOTE TO AFFILIATES

These guidelines are produced in response to numerous requests from unions already grappling with problems of working with SBE, or engaged in negotiations over the introduction of new technology.

The guidelines are not immutable, and will be revised in future as circumstances require.

All unions, whether Federal or State offices, which have already issued policies or negotiated agreements on SBE, are urged to forward these policies and agreements to the ACTU/VTHC Occupational Health and Safety Unit.

All unions about to embark on negotiations over the introduction of SBE, are urged to contact the Unit for specific advice and documentary help.

DEPARTMENTAL POLICY

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File Reference: M81/1732 Contact Officer: Greg Jones Telephone: (062)525550

ABS MANUAL OF PERSONNEL MANAGEMENT
SECTION 18

OCCUPATIONAL SAFETY AND HEALTH

PREFACE

This section of the manual is the ABS guidelines for the Control and Management of Repetitive Strain Injuries (RSI).

Further information may be obtained from the Inspector, Personnel Development, who is Secretary of the ABS National Policy Committee on Occupational Safety and Health.

OCCUPATIONAL SAFETY AND HEALTH

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ABS MANUAL OF PERSONNEL MANAGEMENT
SECTION 18
OCCUPATIONAL SAFETY AND HEALTH

PART A - GUIDELINES FOR THE CONTROL AND MANAGEMENT OF REPETITIVE STRAIN INJURY (RSI)

18.1 AIM

18.1.1 These guidelines aim to :

i) provide a general strategy for identifying and minimising the effect of RSI in the ABS;

ii) describe measures to alleviate the effects of the injury when it has occurred;

iii) outline the responsibilities of all parties involved.

18.1.2 a) The guidelines are intended at this point to apply to all keyboard operators whose job designation falls within the general employment categories of Typist, Data Processing Operator and Accounting Machinists, and to clerical staff who use keyboard equipment as part of their duties.

b) It is anticipated the guidelines may also be applied in a general sense to staff engaged from time to time in fast, repetitive clerical functions. If this is found not to be so then revised guidelines will be issued.

c) There are areas where the guidelines cannot be exact. In such areas an attempt has been made to outline current thinking by professional people, or limits which apply elsewhere as background to the taking of decisions which remain the responsibility of the local supervisor and his/her senior officers. In a number of instances the guidelines reflect practices which had been thought out and adopted by ABS supervisors in response to the growing incidence of RSI.

d) Throughout the guidelines emphasis is placed on the need for consultation between the keyboard operator, supervisor and management on all issues related to the prevention/minimisation and management of RSI.

18.2 REPETITIVE STRAIN INJURY (RSI)

18.2.1 RSI covers a wide range of injuries associated with the overuse of muscles and tendons which generally occur in the fingers, hand, arm, shoulder and/or neck. Such injuries are also referred to as Rapid Movement Injury (RMI) and the terms are interchangeable.

18.2.2 Symptoms may include pain, swelling, weakness and/or numbness in the affected area (see para 18.3.2 below).

18.2.3 The most commonly diagnosed injuries are Teno-synovitis and Carpal Tunnel Syndrome, but include Tendonitis, Ganglion and strain injuries of the shoulder and neck.

Figure 1: Tenosynovitis

An inflamation of the tendons and their sheaths. The sheaths which surround the tendons provide lubrication for them to move. Under certain conditions this fluid becomes granulated and clogged resulting in painful swelling.

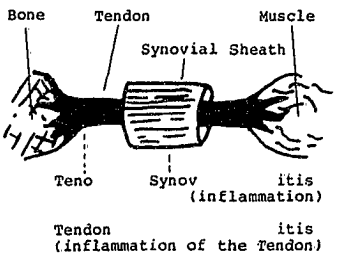
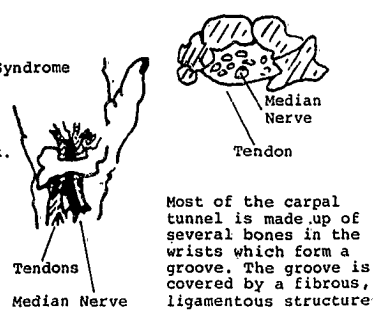


Figure 2: Carpal Tunnel Syndrome

Caused by compression of the median nerve in the carpal tunnel of the wrist. Reduces manipulative skills. Often associated with hand weakness, numbness or pain. In a majority of cases the compression results from swelling associated with tenosynovitis.



Most of the carpal tunnel is made up of several bones in the wrists which form a groove. The groove is covered by a fibrous, ligamentous structure

18.3 *EARLY RECOGNITION OF SYMPTOMS*

18.3.1 It is essential that early symptoms be recognised by the officer and immediately reported to the officer's Supervisor. At first these symptoms may seem trivial, but if recognised early and acted on further development of the injury can be prevented and no permanent damage will result. If the symptoms are ignored permanent damage may occur.

18.3.2 *Symptoms include:*

i) excessive muscle fatigue and soreness;

ii) pain, swelling, numbness and/or tingling of the hand, wrist or forearm;

iii) pain or weakness in the muscles of the arms shoulders or neck;

iv) *crackling sound (crepitus), creaking sensation in* affected area when moved.

18.3.3 It is important that keyboard operators, supervisors and managers understand the personal consequences in terms of pain, incapacitation and decreasing opportunities for successful redeployment if they work on regardless until the condition becomes fully embedded. It is equally important that keyboard supervisors at all levels understand the loss in terms of productivity and increased staffing overheads and administration costs if symptoms are played down or ignored.

18.3.4 Avoidance or minimisation of RSI requires close consultation and a high level of confidence to exist between keyboard operators, supervisors and management.

18.4 RECOVERY FROM RSI

18.4.1 Available studies and the opinions of professional *people active in this field conclude that once injuries such* as tenosynovitis become firmly established full recovery with a successful return to former duties is rare.

18.4.2 ABS experience to date suggests that transfer of RSI sufferers to clerical duties is only partially successful unless carefully managed over the initial months. Duties such as those involving the use of a calculator, photocopier, stapler or simply filing papers can cause distress and lead to *further recurrences.* Supervisors agreeing to take RSI sufferers on transfer need to be aware of this and organise work accordingly.

18.4.3 Operations for such injuries as Tenosynovitis and Carpal Tunnel Syndrome are rarely successful in the view of the patient and expert opinion recommends against such action without the consensus of medical practitioners experienced in the treatment of RSI. The more advanced the injury is, the harder it is to treat. *Remedies may include rest, plastic* splints (plaster ones are too heavy), ice packs, stretching and isometrics. Heat treatment should never be used as it only aggravates inflammation already present.

18.4.4 However, rest of the affected area is seen as the most important factor for recovery. It is important that both the injured officer and the supervisor recognise this and immediate action is taken to provide appropriate and *alternative duties.*

18.5 MINIMISATION OF OCCURRENCES

18.5.1 Professional studies list the areas detailed below in paragraphs 18.6 to 18.1Ø where specific guidelines need to be applied to minimise RSI occurrences among keyboard operators. A major source for the following is "Approved *Occupational Health Guide Repetition Strain Injuries",* National Health and Medical Research Council, Commonwealth Department of Health, June 1982.

18.6 GENERAL ENVIRONMENT

18.6.1 General work environment - the physical and social aspects of the work place;

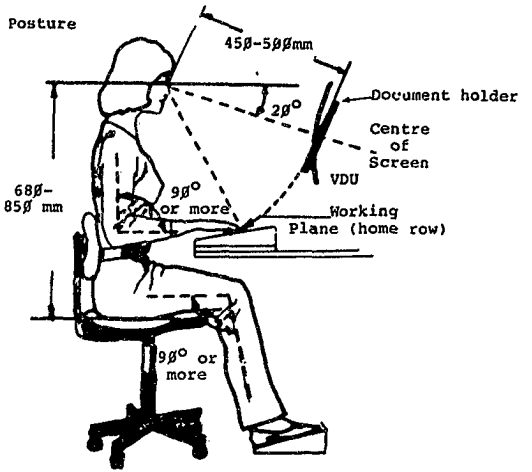
i) Layout, airconditioning and noise factors;

ii) *Correct dimensions and positioning to match* individual operator - no undue twisting of neck or trunk required;

iii) Provides physical comfort - no restriction on normal blood circulation;

iv) Promotes good posture.

Figure 3: Posture



Note:

Allow maximum freedom of movement.
Elbows close to side.
Backrest small enough to allow freedom of movement.
The 'home row' of keys (ASDFGLKJH) should not exceed 3Ømm from the top of the keyboard support surface.
Chair with 5 star base, self locking castors, pneumatic height adjustment, cloth padded seats and have the ability to be adjusted while sitting.
Seat profile should reduce pressure on intervertebral discs and require little static muscular effort.

v) Incorporates adjustable manuscript holder so documents can be placed at optimum viewing distances and angles;

vi) Detailed specifications for design of workstation furniture and equipment are the subject of a number of technical papers which can be obtained from Management Control Section;

vii) Accommodation and furniture standards are the responsibility of Management Services Branch and any queries should be directed in the first instance to the Director, Finance and General Services in Central Office, or the Administrative Officer in State Offices.

18.7 JOB DESIGN

i) Avoid prolonged work in the same position and reduce physically stressful movements;

ii) Incorporate where possible work or job rotation involving a variety of different tasks to avoid over-specialisation of work, and to rest muscle groups and avoid fatigue and strain;

iii) Avoid workload peaks which require prolonged periods at a high keystroke rate (see paras 18.8.1-4 and 18.21.2 below)

iv) Avoid extremes of joint movement of arm, hand, neck and trunk.

18.8 KEYSTROKE RATES

18.8.1 CONTINUOUS keyboard operation at excessively high key stroke rates may expose operators to RSI.

18.8.2 To set appropriate ranges of keystrokes per hour requires consideration of a wide variety of factors, eg age of machine, type of work, whether one or two hands are used etc.

18.8.3 Supervisors and keyboard operators should consult, as needed, on appropriate keystroke ranges for the work being done taking into consideration local factors. The keystroke range adopted should allow operators to work at a comfortable, natural rhythm rather than any sustained forced pace. If agreement is difficult to reach, the local ABS Occupational Health and Safety Committee should be contacted for assistance.

18.8.4 Difficulties are encountered in trying to summarise opinion on safe keystroke rates and the following is provided AS BACKGROUND ONLY to consultations between supervisors and keyboard operators:

(i) For simpler transactions, work in the Australian Taxation Office is allocated on the basis of 11 ØØØ key strokes per hour, which is reduced as the type of transaction becomes more complex,with the most complex transaction assessed at 5 ØØØ keystrokes per hour. Work is allocated on the basis that each operator will spend 5.25 hrs each day operating the keyboard. The Acting Arbitrator in Determination No 327 of 1983 (26 Aug '83) attached an Agreement between the parties which in the relevant part read as follows :

"Maximum and Minimum Rates
In the light of the medical and other evidence presented in the case, the parties supported rescission of the maximum rate of 12,ØØØ kph prescribed by order of the Arbitrator and confirmed that there should be no prescribed minimum keystroke rate."

(ii) Dr Alan Cumpston, Medical Services Adviser, Occupational Health, Department of Health, who was associated with the review of data processing in the Australian Taxation Office recommends the following maximum keystroke rates.

Old Machines	-1Ø,ØØØ kph
New Machines	-11,ØØØ kph
Absolute Maximum Rate	-12,ØØØ kph

18.8.5 The key consideration is that the pace should not be forced, but rather one that allows work to be done at a pace/rhythm that is comfortable to the operator.

18.9 REST BREAKS

18.9.1 There are two definitions of rest breaks:

i) A regular change in work or task - ie a mix of duties or job rotation which provides breaks from continuous keyboard operation eg the typist who is also telephone receptionist, and assists in general office duties etc.

ii) A complete rest from any work activity. This definition applies if the particular job allows no relief from continuous keyboard operation in the form of alternative duties (job rotation).

18.9.2 Rest breaks or pauses are recognised as a necessary part of effective work and have been shown to actually increase total productivity. They are essential in reducing RSI risks where staff are involved in long periods of CONTINUOUS KEYBOARD OPERATION.

18.9.3 The benefits of rest breaks include relief of muscle fatigue and any restriction of circulation due to long periods of sitting and increases in mental and physical awareness. A prime consideration in taking regular rest pauses is to allow rejuvenation of the synovial lubricating fluid (see para 18.4 above).

18.9.4 It can be misleading to lay down fixed or formal rest pauses as length and frequency depend on the individual, the task, environment, equipment, amount of task rotation already built into the job; etc. The individual is considered the best judge and decisions by Supervisors as to the frequency, manner and duration of rest breaks from continuous keyboard operation will normally be more acceptable to staff if they have the opportunity to participate in the decision process.

18.9.5 While the issue of rest breaks lies between the Supervisor and Operator, staff should not operate keyboards continuously at a high keystroke rate over any period beyond one hour without regular rest pauses. It is also essential that rest breaks are regularly spaced throughout the working day. In no circumstances are they a credit to be accumulated.

18.9.6 The following is offered AS GENERAL BACKGROUND ONLY to provide supervisors and their staff with some feel for what may be appropriate in terms of the length and duration of rest breaks from CONTINUOUS KEYBOARD OPERATION:

(i) US National Institute for Occupational Safety and Health (NIOSH) in a 1981 report recommends 15 minute rest breaks after one hour for operators engaged in repetitive tasks;

(ii) APSA policy is for a minimum of 15 minutes rest break SPREAD over a period of one hour;

(iii) ACTU/Victorian Trades Hall Council (VTHC) Occupational Health and Safety Unit recommends (as future policy) regular breaks of at least 15 minutes every hour for repetitive work which does not involve adequate variety and rotation of tasks;

(iv) In relation to data entry work in the Australian Taxation Office, the Acting Public Service Arbitrator in Determination No 327 of 1983 (26 Aug. 1983) made the following point:

"... There is no doubt that regular breaks are necessary from keying duties and ..... on balance consider that the ten minutes break after each hour of work, together with the meal, tea, personal breaks and those occasioned by the nature of the work itself provide adequate rest from key board duties. ...".

18.1Ø OVERTIME

18.1Ø.1 Supervisors and keyboard staff need to be aware of the added risk of RSI by extending the hours of keyboard operation beyond normal daily working hours ie there is a strong case for overtime to be limited to weekends.

18.1Ø.2 The Arbitrator in the interim order in respect of data preparation officers in the Australian Tax Office directed that overtime not be worked in the evenings. This is interpreted to mean the normal working day beyond flextime limits should not be extended by a requirement to work evening overtime. This limitation at present applies only to the Australian Taxation Office.

18.1Ø.3 Given the associated risks of extending normal hours Supervisors should apply strict tests of essentiality before requiring keyboard operators to work evening overtime. Under no circumstances should keyboard staff who have had some history of RSI or possible RSI be required to work overtime beyond normal daily hours.

18.11 COMPENSATION

18.11.1 Repetitive strain injuries arising from keyboard operations are subject to normal compensation procedures, which, despite the best intentions of all parties, can be protracted.

18.11.2 Case studies (by external organisations), supported by similar studies in relation to ABS keyboard operators, suggest the morale and cooperation of the injured officer may decline rapidly as:

i) differing medical opinions and further referrals to specialists are encountered;

ii) income drops to compensation levels or payment of salary is delayed by procedural requirements; and

iii) associated financial and social pressures erode the self image. ('Accident Victim Syndrome')

18.11.3 The supervisor can assist by:

i) minimising delays in transmission to the Personnel Section of medical certificates, sick leave applications etc;

iii) the officer understands the high risk of re-occurrence of RSI in seeking to recover former speeds in a short period.

18.13 WELFARE - CENTRAL OFFICE

18.13.1 Information, counselling and support services to ABS officers suffering from rapid movement injuries are available on a confidential basis from the Welfare Officer (3a5Ø6, Phone 52 6739).

18.13.2 Staff encountering difficulties as a result of RSI should not hesitate to contact and discuss problems with Welfare Staff.

18.13.3 Similarly, Supervisors should have a clear perception of the welfare services available and should seek to involve the Welfare Officer when considered appropriate.

18.13.4 The Central Office of the ABS has a Self-Help Group for past and current sufferers of RSI and the group discusses amongst other things, rehabilitation, social, professional and personal problems. The Capital Territory Health Commission runs a similar program.

18.13.5 Guidelines on the introduction and use of an "Energy Break" Program for ABS officers is available from the Welfare Section.

18.13.6 Officers requiring further information should contact the Welfare Officer.

18.14 WELFARE - STATE OFFICES

18.14.1 In each State an officer has as part of his/her duties responsibility for providing confidential staff welfare services.

18.14.2 Officers seeking welfare services as described above will find their Welfare Officer listed in the local telephone directory.

18.14.3 State Office Welfare Officers should ensure they maintain close liaison with Central Office Welfare Staff on further developments in this field.

18.15 GENERAL RESPONSIBILITIES

18.15.1 The issues covered under the headings in paras 18.16 to 18.21 below are not exhaustive. They are meant to be read in conjunction with all other areas of the guidelines.

18.16 OPERATORS

18.16.1 Keyboard operators should:

i) be aware of correct posture and be conscious of retaining correct posture throughout the working day;

ii) understand the value of maintaining a generally good level of physical fitness in minimising RSI risk;

iii) advise Supervisor immediately of any injury received (work or otherwise eg sport or car accident) which may affect ability to undertake normal keyboard duties or which may be aggravated by undertaking normal keyboard duties;

iv) report to Supervisor any equipment, furniture or workstation fault which inhibits correct posture or proper keyboard operation;

v) know how to recognise the early symptoms of RSI. Report such symptoms to Supervisor immediately. A sore neck or wrist is not an unusual event and a sensible approach to proper treatment by resting the affected area for a short while (1-2 days) will usually see the problem quickly clear. To press on regardless will only aggravate the situation and will increase the risk of RSI. Operators with RSI symptoms should not take pain killers in order to keep working.

18.16.2 If symptoms do not disappear with rest (alternative duties which rest the area affected), advise your Supervisor and consult your doctor. Similarly, medical advice should be sought if the symptoms do disappear with rest but recur on resumption of work.

18.16.3 Operators consulting their general practitioner should not feel shy about querying him/her on his/her knowledge of repetitive strain injury and obtaining a referral to a specialist if appropriate.

18.17 SUPERVISORS

18.17.1 Supervisors of staff involved in rapid, repetitive tasks have the key role in minimising RSI occurrences. Their responsibilities are highlighted throughout these guidelines. Some specific responsibilities include, but are not restricted to, the following:

i) the need for a high level of awareness of RSI; consult and maintain close liaison with specialists in support groups (eg Training, Welfare, their local state ABS Occupational Health and Safety Committee) on what contributes to its occurrence, work practices or procedures etc necessary to minimise occurrences, the importance of recognising early symptoms, identifying staff at risk and acting immediately to ensure symptoms are not aggravated;

ii) the proper instruction of all staff in the causes of RSI and in the methods for avoiding it. New staff seeking higher proficiency rating and staff returning after an absence of some months are particularly vulnerable to RSI and need to be closely monitored; (refer para 18.9.2 below).

iii) the need to instruct keyboard staff in correct posture and adjustment of furniture to suit each officer;

iv) the resolution of problems with furniture or equipment which inhibit correct posture or proper keyboard operation;

v) a requirement to liaise with keyboard staff on appropriate rest pauses; the availability and suitability of "energy breaks" (for details contact ABS Welfare Officer); and ensure staff do not operate keyboards without regular rest pauses.

18.17.2 Supervisors need to ensure the development of adequate early warning systems in short to medium term future workloads to assist in smoothing out workload peaks (see also para 18.18.2). All possible cases of RSI should be reported to Personnel Section and the Supervisor should liaise with all parties involved to ensure appropriate action is taken to avoid any aggravation of the injury.

18.17.3 Supervisors of outposted keyboard staff need to monitor their workloads fairly closely. The rapport and job involvement developed in outposted situations can mean sustained pressure for quick turnaround of work requiring keying rates that place such staff at considerable risk. It is essential Supervisors liaise with users of outposted keyboard operators to ensure they understand the requirements set down in these Guidelines.

18.18 *TRAINING RESPONSIBILITIES (COMPUTER SERVICES AND MANAGEMENT SERVICES)*

18.18.1 Training areas need to review existing training programs and incorporate in future programs sessions which will:

i) improve the general awareness of all officers on work related injuries and the commonsense practices needed to reduce the risk of such injuries;

ii) provide specific detailed training on the avoidance of work related injury for officers who will spend a reasonable amount of their time on keyboard duties;

iii) provide appropriate training for supervisors of staff who are largely employed on keyboards. This should include training in counselling and in the supervisor's special role in occupational safety and health.

18.18.2 In regard to RSI the following aspects should be considered in the review and development of courses and sessions:

i) emphasis on the prevention of RSI due to poor success rate in rehabilitation and return to normal keyboard operations of RSI sufferers, including an outline of the biological aspects of RSI injury;

ii) importance of good posture, the risks associated with poor posture and the techniques of muscle relaxation;

iii) consideration of keystroke rates and importance of rest pauses;

iv) operation, adjustment and minor maintenance of equipment and furniture (eg clean screens, correct chair adjustment, correct table and keyboard placement, correct placement of source document, good lighting);

v) importance of speedy fault reporting;

vi) importance of early reporting of RSI or probable RSI symptoms and the process for reporting and referring cases of injury.

18.18.3 The ABS training progams in this area and the need for updating and reinforcement of the programs should be reviewed by reports to the ABS National Policy Committee on Occupational Safety and Health.

18.19 PERSONNEL MANAGEMENT SECTION

18.19.1 Personnel Management procedures should:

i) encourage staff to report RSI symptoms immediately;.

ii) require regular review of compensation and invalidity procedures to ensure quick, expert advice is available on compensation issues and RSI sufferers are not subjected to unnecessary stress and any hardship resulting from delays is minimised. This should include issue of guidelines to State Offices;

iii) emphasise need to quickly transfer RSI or possible RSI sufferers to other duties which allow the affected area to be rested until situation is clarified;

iv) include maintenance of specific records on RSI to:

- facilitate monitoring of occurrences by location, type,length of duration etc;
- test effectiveness of preventative and rehabilitative measures;
- provide appropriate feedback to ABS management, line management and ABS Occupational Health and Safety Committees.

18.19.2 Records maintained by Personnel Management should include an 'accident' report to management on each new case aimed at identifying the particular factors most likely to have led to the onset of RSI symptoms and any remedial action taken or proposed. A summary of these reports should be sent regularly to the Occupational Health and Safety Committee in the particular Office.

18.2Ø FINANCE AND GENERAL SERVICES

18.2Ø.1 The goal in all purchases of office furniture and equipment should be to improve the ergonomic suitability of such items in the ABS with a view to reducing RSI occurrences.

18.2Ø.2 To minimise risk to keyboard operators of RSI, Finance and General Services need to act immediately on rectifying any reported damage to furniture and equipment and maintain regular inspections of furniture and equipment in keyboard areas.

18.2Ø.3 Finance delegations for the purchase of:

i) office equipment incorporating a keyboard operation; and

ii) workstation furniture for keyboard operators;

should only be exercised where the selection process has involved a proper consideration of ergonomic factors. A manufacturer's claims of good ergonomic design need to be proven and cheaper prices should not be of greater importance than good ergonomic design when selecting furniture and equipment for purchase.

18.2Ø.4 If the items to be bought represent a major purchase, or are to be included in major ongoing replacement program, the decision to purchase must be preceded by professional advice on their ergonomic suitability. Though external consultants may be required, this advice may be available within the APS. Help in obtaining professional assistance on ergonomic issues can be provided by Management Control Section, Central Office.

18.2Ø.5 A decision to proceed with proposed purchases contrary to such advice, should not be taken without the agreement of the ABS National Policy Committee on Occupational Safety and Health.

18.2Ø.6 Printing of data entry forms. Finance delegations should not be exercised to approve the placement of orders for forms to be used for bulk data entry input unless the design of the form has been endorsed as suitable by an officer nominated by CSD/CSB Management.

18.21 ABS MANAGERS

18.21.1 Managers need to maintain close liaison with keyboard supervisors to minimise situations which can put operators at risk eg:

i) Late advice of significant workload with urgent processing deadlines;

ii) Changes to work schedules without appropriate consultation;

iii) Poor forms design.

18.21.2 In designing statistical collection forms to minimise respondent/user problems, managers need to consult with data entry supervisors on such issues as readability, balance, colour contrast and flow for keying purposes. All forms should be tested by data entry supervisors and the final design endorsed by an officer nominated by CSD/CSB management before forms are printed.

18.21.3 If unexpected workload peaks occur, the following options should be considered in consultation with keyboard supervisors

- revising the deadline
- deferring other work
- setting lower verification rates for some data entry work
- weekend (not evening) overtime
- transfer of work to another ABS site.

It is important to ensure that keystroke rates do not put keyboard operators at risk (see paras 18.6.1-5). If these options are unsatisfactory then Management Services should be consulted for alternatives in processing the workload. At the moment this appears limited to additional full time or part time ceiling and the recruitment of temporary staff, but may come to include contracting of some work to outside agencies.

18.21.4 Management and all staff engaged on systems development need to be aware of ergonomic considerations and their impact on data entry work when assessing design options during system development. CSD Operations and Software Branch must be fully consulted before a design option is approved.

18.22 BIBLIOGRAPHY

Repetition Strain Injuries - Approved Occupational Health Guide. National Health and Medical Research Council. June 1982.

Repetition Injury in Data Processing Operators - Australian Taxation Office. Dr. A.G. Cumpston. Dept of Health.

Injury by Repetition - The Costs are High. Work and People Vol. 8 No 1 1982. Department of Employment and Industrial Relations.

VDU's at work. Occupational Safety and Health. Working Environment Series 13. Dept of Science and Technology. 1981.

Dying For a Living. Impact. Australian Council of Social Service. Vol 11, No 2, May 1981.

The cost to industry of tenosynovitis and related diseases associated with repetitive work. K.N. Baidya and M.G. Stevenson (Associate Professor). School of Mechanical and Industrial Engineering. Univ of NSW. 1982.

The ergonomics of work stations equipped with visual display units. Dr Phil. G.W. Radl and others. Nixdorf Computer 1982.

Ergonomic Principles Applied to Work Place Design. Dr Phil., G.W. Radl and others. Nixdorf Computer 1982.

Guidelines for the prevention of repetitive strain injury (RSI). ACTU-VTHC Occupational Health and Safety Unit. August 1982.

Guidelines for Working with Screen Based Equipment. ACTU-VTHC Occupational Health and Safety Unit. May 1982.

Tenosynovitis-overuse problems. Workers Health Centre, Lidcombe, Info. Leaflet No 1. Nov 198ø.

Tenosynovitis - Critique of Existing Legislation. Submission to NSW Govt. Inquiry into Occupational Safety and Health, 1979. Workers Health Centre. Lidcombe. Feb 198ø.

Carpal Tunnel Syndrome and Selected Personal Attributes. T.J. Armstrong, Ph. D., and D.B. Chaffin Ph.D. Journal of Occupational Medicine. Vol 21 July 1979.

Human Factors in Office Automation. Wilbert O. Galitz. 198ø.

Occupation in Relation to Carpal Tunnel Syndrome. M.Q. Birkbeck and T.C. Beer. Depts of Rheumatology and Rehabilitation, Northampton and Kettering District Hospitals, Northampton Shire 1975.

Ergonomics and Occupational Health. Proceedings of the 19th Annual Conference of the Ergonomics Society of Australia and New Zealand, University of Melbourne, November 25-26, 1982.

APSA Policy on Repetition Injuries. APSA Review June 1982.

Department of Defence

DEPARTMENTAL CIRCULAR MEMORANDUM No. 92/84

1 AUGUST 1984

DEPARTMENTAL WORD PROCESSING AND TYPING RESOURCES -
EFFECTS OF REPETITION STRAIN INJURIES - ALLEVIATION OF WORKLOAD

1. The word processing and typing workloads in the department have increased considerably in the last few years, due partly to increases in staff numbers, project teams, working parties and the like.

2. Whilst the introduction of word processing technology has provided increased productivity, the increasing workloads, together with recruitment shortfalls and the continuing requirement to provide steno-secretarial relief from reduced numbers of manual typists have placed an inordinate strain on the Department's word processing and typing pool resources.

3. In addition to limited equipment and approved staffing levels, output, particularly in word processing centres, has become further constrained by the effects of repetition strain injuries. The growing incidence of confirmed and suspected repetition strain and other work-related injuries has reached serious levels in WP centres and typing pools, with a high proportion of staff being on sick leave, working reduced keyboard hours or redeployed to other duties. The prevalence of repetition strain injuries has necessitated an almost complete abandonment of overtime thereby leading to a further loss in flexibility and output.

4. To the extent possible with available funds, the department is proceeding with the acquisition of additional word processing equipment to enhance the existing word processing service. Wherever possible known preventive measures against repetition strain injuries in terms of ergonomics, work environment and enforced hourly rest breaks have been introduced. The feasibility of decentralizing word processing/typing capability in an office automated environment with perhaps a multi-skilled work group is also under active consideration.

5. Medical evidence is that high keystroke rates for extended periods are a contributory cause of repetition strain injuries amongst keyboard operators. Accordingly, the high incidence of injuries being experienced within the word processing/typing service now calls for firm remedial measures to be instituted by management with the understanding and co-operation of authors as follows:

a. Word processing and manual typists are to take hourly breaks of 10 minutes duration away from keyboard operation; duties, work type and content of each typist is to be varied on a regular basis throughout the day by the supervisor wherever possible.

b. Overtime is not to be worked, except in exceptional circumstances.

c. Word processing/typing supervisors are to give first priority to the most important Departmental correspondence, etc destined for authorities outside the Department and in commands and units or to higher executives such as the Secretary, CDFS, Chiefs of Staff and Deputy Secretaries.

d. Whilst the existing problems and work saturation levels persist no word processing/typing resources can be made available to undertake new major workloads, eg work/reports of project groups or resulting from new initiatives or equipment acquisitions, etc. Consideration will need to be given to contracting out such major workloads to private bureau services. Funds will need to be sought for this purpose.

e. No material will be rekeyed when it is already available in a form that can be used satisfactorily to provide the document required by the customer and acceptable to the recipient.

f. Authors are to make maximum use of handwritten minutes for inter-and intra-Division/Branch correspondence. Manuscript compilation should also be employed in the case of forms completion, lists, printed proforma letters that need only minor additions, minor corrections to internal correspondence and correspondence relating to officially recognized recreation activities, eg notice of meetings and related minutes. Unless correspondence is going outside the Department, typographical errors and other minor corrections should be amended in manuscript.

g. Authors are requested to keep their requests for typed drafts to an absolute minimum. Manuscript drafts should be written in a legible presentation using ball-point or fountain pen not pencil. Drafts written with pencil or felt tip pens will not be accepted. Manuscript drafts should be checked before submission for word processing or typing, to reduce staff errors and poor grammatical construction.

h. Authors are requested to pay particular attention to deadlines requested. Deadlines, if they are to be met, need to be realistic and achievable. In the case of large jobs, the work should be submitted to word processing centres/typing pools progressively.

i. Steno-secretarial support will not be provided for periods less than 2 weeks. Temporary relief for Steno-secretary Grade II positions are to be provided by steno-secretaries in the division concerned, as with short term relief for clerical positions. Divisional and Branch heads are to ensure that steno-secretaries assist, to the maximum extent possible, with the typing workloads in their functional areas.

6. Word processing/typing management will continue with every effort to make the best use of available resources in order to meet the competing requirements of authors. However, if the word processing/typing service is to cope with essential demands whilst experiencing the present difficulties, the support and co-operation of management and authors in the implementation of the measures outlined herein is essential.

R.B. Finnegan
First Assistant Secretary
Industrial

REFERENCE: DM84/15687

DISTRIBUTION: (Canberra Only) SDL 6, 7, 8

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EARLIER CM CANCELLED: 17/84

DEPARTMENT OF EDUCATION AND YOUTH AFFAIRS

POLICIES ON OPERATION OF VISUAL DISPLAY UNITS

Retraining

1. There will be no discrimination against staff because of an inability to use VDUs due to health problems, e.g. eyesight disorder, RSI, epilepsy, etc. Any such staff member will be retrained for career advancement purposes in another area, unless the staff member is certified unfit by a medical doctor. This policy may require review if the incidence of RSI etc. becomes such that the Department is unable to place staff and still carry out its functions.

Quotas

2. There will be no individual quotas, keystroke rates or any other measures applied to VDU work. (It will be necessary to record aggregate data and aggregate throughput of work to determine establishment and equipment requirements.)

Rest Breaks

3. Staff operating VDUs will be required to take a 10 minute rest break after one hour's continuous operation of VDUs. Keyboard staff will be clearly advised as to the purpose of the relief period and that it is in their own interest to use it effectively, e.g. by the performance of quite different duties or by a brief period of specially designed exercise.

Eyesight Tests

4. The matter is under review between the PSB and staff associations. In the meantime, staff required to work consistently with VDUs will be referred to the CMO for eyesight tests. The test will be as prescribed by the Department of Health Memoranda 78/12701 of 19.4.82 and 17.12.82.

5. Follow-up sight checks will be conducted in accordance with Department of Health Memoranda 78/12701 of 19.4.82 and 17.12.82.

6. Results of eyesight tests will be released to individual staff members.

7. All eye tests will be conducted during office hours. Staff are considered to be on duty while away from the office for such tests and examinations.

8. The Department will bear the costs of tests arranged by the Department.

9. The Department will not meet the cost of corrective glasses (refer PSB Memo 81/418 of 23.10.81.); but the Department is seeking further clarification on this matter.

Repetitive Strain Injury

10. The Department will refer staff to the CMO immediately when there is evidence of the onset of RSI symptoms.

Pregnant Staff

11. Where the operation of VDUs causes concern to a pregnant staff member, the Department will make every endeavour to redeploy the staff member without loss of any entitlements for the period of time involved.

Office Equipment

12. The Department will progressively provide a correctly designed desk and gas powered chair for each VDU station as funds become available.

13. The Department has established a consultative mechanism which ensures that staff associations are consulted regarding standards for VDUs.

14. Adjustable document holders and footrests will be provided on demand.

Work Environment

15. VDU workstations will be positioned to minimise glare from natural light sources.

16. The level of artificial illumination at VDU workplaces will be adjusted to meet approved standards in consultation with staff.

17. Local desk lighting (task lighting) to view source documents will be provided on request as an option to VDU operators.

18. Glare reduction screens will be provided on request as an option to VDU operators.

19. Noise levels will be maintained at or below 55 Db(A) in areas where work involves high levels of concentration, and 65 Db(A) in other areas.

20. Impact printers will be sound insulated.

21. As far as possible the VDU workplace will be free of static electricity.

22. The Department will negotiate with Department of Administrative Services to ensure maintenance of appropriate temperature, humidity and airflow in dedicated ADP input areas.

Training

23. The Department intends to conduct awareness training for VDU operators, e.g. avoidance of RSI, the need to take rest periods, warm-up exercises.

24. The Department will provide training for staff in ergonomic aspects, e.g. posture, adjustment of special desks and chairs.

25. Keyboard training will be provided.

DEPARTMENT OF EMPLOYMENT AND INDUSTRIAL RELATIONS

PERSONNEL AND ESTABLISHMENTS POLICY GUIDELINES

Number 14
Reference C84/666
Date May 1984

ALL STAFF

REPETITION STRAIN INJURY

This guideline aims to provide an interim strategy for the prevention of repetition strain injury (RSI) in the Department, for the identification of symptoms as early as possible and for the handling of cases in an appropriate way. It is directed at any staff engaged from time to time on fast, repetitive work and more specifically at keyboard staff and their supervisors.

The guideline is interim because repetition strain injury is a subject area currently under examination by medical authorities and by agencies concerned with occupational health and safety. In addition, a number of aspects are the subject of ongoing negotiations at national level with staff associations. The results of medical research and of developments in national and Service-wide agreements and procedures may require some future refinement of this guideline.

Definition of RSI

Repetition strain injury (RSI) is the collective name given to muscle and tendon injuries resulting from the continuous hand and body movements and static muscle load demanded by numerous forms of repetitive work. Such injuries are also referred to as Rapid Movement Injury (RMI) and the terms are interchangeable.

A repetition injury can occur in any muscle/tendon area used for fast, repetitive work such as keyboard operation, rapid repetitive clerical tasks like writing, stamping, sorting, operating hand duplicators and collating. In the clerical area keyboard and clerical workers performing rapid repetitive tasks find the injuries occur mainly in the fingers, hand, wrists and shoulder area and/or neck.

A large number of specific injuries have been associated with rapid repetitive movements which require some strength, either sustained pressure or repeated pressure movements. The most common injuries are:

tendonitis (in various tendons)
Peritendonitis
Tenosynovitis
Tension neck syndrome
Carpal Tunnel Syndrome
Ganglion
Muscle strain, or sprain
Epicondylitis (tennis or golfer's elbow)

Aspects of repetitive work most strongly linked with the development of RSI include:

- force, speed and direction of movement
- frequency of movement
- total number of movements
- work posture
- rate of work
- stressful working environments.

RSI can arise from poor workplace design, poor job design, inadequate tools and equipment, inappropriate administrative procedures and excessive workrates.

RECOGNITION OF SYMPTOMS

Repetitive strain injuries can be cured if action is taken at an early stage. Once the condition has become chronic damage may be done which may lead to permanent disability. It is essential that when early symptoms are recognised by the officer they are immediately reported to the officer's Supervisor. Medical advice should be sought, whenever possible, from a medical practitioner who is competent in the diagnosis and treatment of RSI.

Symptoms of RSI may include:

- excessive muscle fatigue, soreness or stiffness;
- pain, swelling, numbness and/or tingling of the hand, wrist or forearm;
- pain or weakness in the muscles of the arms, shoulder or neck;
- weakened grip;
- crackling sound (crepitus), creaking sensation in affected area when moved

At first the pain, swelling or numbness may occur only occasionally while doing the repetitive work, however if preventive action is not taken then the condition worsens so that it may persist while doing other (non repetitive) movements or even while not using the injured part at all. The symptoms of a repetitive injury may become worse as the day or week of work

progresses and feel better in the morning or beginning of the week after the rest from repetitive work over the night or weekend.

Staff should not be reticent about reporting injuries in their initial stages and supervisors and co-workers need to appreciate that such problems are genuine and worthy of appropriate response.

Management at all levels should encourage staff to report injuries and allay any fears that staff will be disadvantaged because of their injury.

Procedures for handling cases should be well understood so that injured staff can be adequately advised of the likely outcome of reporting an injury.

PREVENTION OF RSI

Job Design

Work should be designed to avoid or reduce:

- prolonged work in the same position and physically stressful movements
- workload peaks which require prolonged periods at a high keystroke rate
- extremes of joint movement in the hand, wrist, arm, neck and trunk
- mental stress

The Department wishes to encourage officers to make suggestions about improvements to job design and environmental factors which affect their health. Supervisors should discuss any such proposals with Department management.

Features of the general work environment or design of the job that might produce RSI should be drawn to the attention of supervisors. Where possible job rotations involving a variety of different tasks should be used to avoid over specialisation of work and to rest muscle groups. The assistance of the Department's Working Environment Branch should be sought regarding the analysis of problems and development of recommendations for improvements. Experiment in job rotation should take place in consultation with affected staff and staff associations.

A suggested checklist for the use of supervisors and staff is attached. This checklist is derived from the publication "VDU's at Work" published in 1983 by the Working Environment Branch.

Rest Breaks and Task Relief

Rest breaks or pauses are essential in reducing RSI risks where staff are involved in long periods of continuous keyboard operation or in performing other repetitious movements.

The benefits of rest breaks include relief of muscle fatigue, improved circulation after long periods of sitting, and increases in mental and physical wellbeing. Regular pauses in particular allow rejuvenation of the lubricating fluid that surrounds tendons.

A regular change in work or task such as a mix of duties or job rotation may provide breaks from continous keyboard operation. An example is the typist who is also telephone receptionist and assists in general office duties, or the employment officer, who accesses computer information in the course of assisting a job seeker.

Where a change in duties is not achievable a complete rest from continuous keyboard operation is vital.

In these cases local management should arrange for the provision of rest breaks in addition to normal lunch and tea breaks and normal health breaks. The frequency and duration of breaks depend on a number of factors including the task, the environment and the equipment. As a general guide where sustained keying is involved and the opportunity to perform a mix of other tasks is not available rest breaks may be up to 10 minutes in duration and occur after one hour's work.

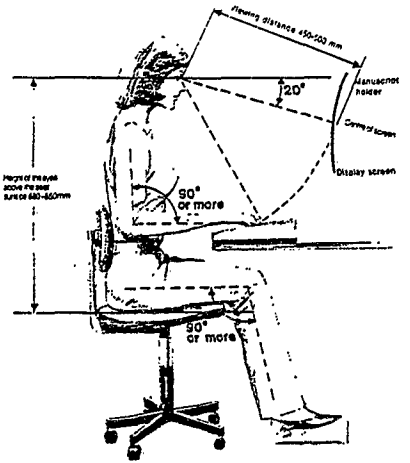
The question of the frequency and duration of rest breaks is the subject of on-going negotiations between staff associations, Departments and the Public Service Board. Staff associations are of the view that where sustained keying is involved rest breaks should occur within every hour and be of 15 minutes duration.

Pending any results of further negotiations between management and staff associations the Department will implement arrangements for rest breaks as described above.

Design of Furniture and Equipment

Furniture and equipment should be designed to minimise bad posture, undue neck or trunk twisting etc. and be adjustable to the physical needs of individual operators.

A good work station relationship is illustrated by the following diagram.



Recommendations for a VDU workplace.

SOURCE: VDUs at Work Working Environment Series No. 13, Working Environment Branch, DEIR AGPS 1983

The provision and maintenance of ergonomically designed furniture and equipment is the responsibility of Management Services areas in Central Office and Regions or CES Resources Branch, as appropriate. Decisions on the type of furniture and equipment to be provided will be taken in consultation with the user area taking into account the specific nature of the task performed. Should equipment be found faulty or be difficult to use by the operator it should be repaired or replaced without delay.

Keystroke Rates

The rate at which keyboard work is performed will vary depending on the age/type of machine, type of work, whether one or two hands are used and so on.

A reasonable rate of work varies with the capacities and experience of the worker concerned and the type of work being done. Staff should be able to complete work at a rate that is comfortable to them and does not lead to the development of RSI's. The basis of work allocation must take these factors into account and should be arrived at in consultation with the staff involved.

Work rates should be set as job entry requirements only and should not be used to monitor or discipline workers. Statistical workload information provided by electronic systems will not be used to monitor or determine work rates.

Accustomisation

Staff who are newly employed, or who are returning from an absence of two weeks or more need to be allowed a period of adjustment to repetitive work which allows their muscles and tendons to become accustomed to the job demands. The adjustment period should be for a minimum of one working week. This can be achieved by job rotation and rest breaks. Work rates should only be increased gradually over the period of accustomisation.

Overtime

Supervisors and keyboard staff need to be aware of the added risks of RSI by extending the hours of keyboard operation (or other work involving repetitious movements) beyond normal daily working hours.

Given the associated risk of extending normal hours supervisors should apply strict tests of essentiality before requesting keyboard operators to work overtime.

IDENTIFICATION AND DIAGNOSIS OF RSI

Staff who suspect they may be suffering from RSI should notify their supervisors promptly and seek advice from their own medical practitioners. Staff associations will be advised on a regular basis of RSI cases.

In each case, supervisors should immediately inform through their Branch Head the First Assistant Secretary (Management Services) in Central Office or the Assistant Director (Management Services) in Regional Offices. A written report should follow detailing the circumstances of the case, including if available, information on the diagnosis of the medical practitioner. The supervisor's report to include, where appropriate, recommendations for changes to work practices to avoid the recurrence of similar problems.

Where an officer's doctor diagnoses RSI and recommends sick leave or alternative duties, immediate appropriate action will be taken by the Management Services area in consultation with the officer and supervisors involved.

Where alternative duties are recommended an examination of the tasks involved will be undertaken by a qualified ergonomist/physiotherapist wherever available to determine what duties are appropriate. Duties will be discussed with the injured worker and the supervisor of the area concerned and any placement will be monitored in order to avoid recurrence of the symptoms. Injured staff will be advised of their rights to seek compensation for the injury and provided with appropriate report forms and information on how to make a claim.

Where sick leave in excess of 13 weeks is advised staff should be informed that they may be subject to the provisions of the CE(RR) Act and advised of the procedures which apply under that legislation.

AGGRAVATION OF INJURIES

Repetition strain injury, whether caused by work related or non-work related activities, may become aggravated by repetitive tasks performed in the workplace e.g. RSI caused from typing may be aggravated by writing. If staff experience symptoms whilst performing any duties associated with their normal positions or whilst redeployed to alternative duties, they should notify their supervisors. Further medical advice may need to be sought.

TEMPORARY REDEPLOYMENT

Where the officer's doctor diagnoses RSI and recommends alternative duties, the officer will be referred to the Commonwealth Medical Officer.

Where medical opinion states that an officer may return to work but must avoid certain duties, every effort will be made to provide alternative work, in consultation with the officer concerned.

Medical advice on temporary redeployment should contain, where practicable, specific reference to duties which can or cannot be performed and information on a time period after which the temporary arrangements may be reviewed.

PERMANENT REDEPLOYMENT

While the overall objective of the Department, as demonstrated by the contents of this guideline, is to prevent repetition strain injury there may be cases where repetitive work, such as sustained keyboard operation, can no longer be undertaken. Action will then be taken to effect the permanent redeployment of the officer to a position with duties which can be efficiently and safely performed.

Retraining may be necessary to facilitate redeployment and where this is the case the officer will continue to be paid at his/her substantive level for the duration of the retraining program. The aim is to redeploy effected officers to positions at their substantive level or equivalent so that they are not financially disadvantaged.

Officers will be given priority in redeployment at their substantive or financially equivalent level. However, where promotion is involved they will still be required to compete with all other applicants.

The provisions of the CE(RR) Act may be used if all possible avenues of redeployment within the Department have been exhausted and after affected officers have received adequate counselling.

STAFF TRAINING PROGRAM

In order to achieve the aims of this guideline in relation to the prevention, early identification and reporting and effective handling of RSI cases, a Departmental training program will be implemented for all staff, in consultation with staff associations.

The program will include information on the causes of RSI, the efficient use of muscles and recommended safe working practices. It will also cover the roles of management and co-workers in the development of supportive working environments, to help prevent RSI, to ensure that staff at all levels have a full understanding of the problem and to ensure staff suffering RSI receive appropriate treatment and assistance.

For further information

- VDUs at Work - Working Environment Services No.13
  - Working Environment Branch, DEIR AGPS 1983

  (Contains comprehensive bibliography)

- National Health and Medical Research Council -
  Occupational Health Guide : Repetition Strain Injuries,
  NH & MRC, Canberra 1982

- Working Party paper on Repetition Strain Injuries -
  Public Service Board, September 1983

- Visual Display Units - A Cakir, D J Hart and T F M Stewart,
  J Wiley and Son, London 1980

SUGGESTED CHECKLIST FOR VDU WORKPLACES

This checklist does not indicate the importance of a particular element of the overall design. This will depend upon the particular individual requirements of the installation, and a simple YES/NO type answer is often not adequate. The 'weighting', i.e. 'the importance', of a particular element must be considered.

ANTHROPOMETRIC FACTORS

- Are all items of equipment and job aids which must be manually operated within normal arm reach of the operator, requiring only minor movement of the trunk?
- Is there sufficient room to accommodate the operator's legs, to provide knee-space and thigh clearance.
- Is the leg area wide enough to permit comfortab leg movement when getting out of the chair?
- Is a footrest which will support the whole foot provided for use, if desired, by operator?
- Is the chair stable? Does it have roller castors to facilitate movement? Are they appropriate for the floor surface?
- Is the seat height easily adjustable?
- Is the height of the backrest easily adjustable
- Is there guidance available to the individual operators to help them achieve optimum adjustment of their chairs?
- Is the angle of the backrest easily adjustable (thus varying the effective seat depth)?
- Is the angle of gaze to the screen in the range 10° - 30° below the horizontal when the chair is correctly adjusted?
- Is the angle of the forearm to the upper arm greater than or equal to 90°?
- Is the angle of the lower leg to the upper leg greater than or equal to 90°?
- Is the chair designed so that there is no pressure deforming the muscles and other soft tissue on the underside of the thighs and buttocks which could restrict circulation to the legs?

...2..

- Does the work station design ensure that there is no undue twisting of the neck or trunk of the body?
- Is an adjustable copyholder provided so that documents can be placed at the optimum viewing distances and angles? Is a copyholder needed or appropriate?

THE DISPLAY SCREEN

- Are all characters in sharp focus and resolution?
- Is the display easily legible?
- Is there absence of flicker, jitter or shimmer?
- Is there a program for the regular cleaning and maintenance of the visual display units? Is a cleaning kit supplied?
- Is brightness adjustable on the display screen?
- Does the display screen have a matt surface?

TASK FACTORS

- Are there adequate work surfaces for large documents, completed work or for writing?
- Are the work surfaces suitably located with respect to the operator who will work the unit?
- Are the locations of other items of office equipment planned for, so that they are easily accessible?
- Does the job provide adequate variety? e.g. relief from repetitive keying.
- Is the task planned so that the operator has the opportunity for relief from the task occasionally?

DEPARTMENT OF HOME AFFAIRS AND ENVIRONMENT

MINUTE

Originating Office:

Ref:

DEPARTMENTAL CIRCULAR NO: 473

DISTRIBUTION: ALL STAFF

Repetitive Strain Injury

All staff will be aware of the very high incidence of repetitive strain injury (RSI) in the Department. At present, there are at least 20 diagnosed cases, including keyboard and clerical staff.

2. The attached report was recently prepared by the Typist Controller, who is currently on sick leave suffering from RSI, and gives an indication of the activity being initiated to alleviate the incidence of RSI in the Department.

3. The problem is one that is shared by the entire Department and if it is not addressed in a realistic and effective manner, keyboard resources could disappear altogether.

4. While attention to such matters as rest breaks, exercises, ergonomic furniture, redesign of traditional keyboard operators' duties, gradual reintroduction of full-time keyboard duties upon return from leave of RSI sufferers and occupational health aspects generally should reduce the incidence of RSI much more is needed. It is now accepted that other factors such as reduction of stress, positive attitudes of line officers to keyboard staff and the presence of a supportive atmosphere also play a large part in reducing the incidence of RSI. All staff can assist in reducing stress and lightening the typing work-load if they:

- write reports, minutes and Ministerial responses concisely;
- use handwritten minutes and notes for file whenever possible;
- clear drafts of as many papers as possible before sending them to be typed;
- make minor amendments to typed finals by hand wherever possible;
- write as legibly as possible;
- thank keyboard staff for tasks well done;

- respect keyboard operators need for rest breaks and exercise and do not interrupt these breaks or make deprecatory comments;
- do not impose unrealistic deadlines for typing or word processing;
- ensure that keyboard staff are not expected to resolve competing priorities for their services.

5. Without the assistance of all staff on this matter the typing services might cease to operate at all.

P.J. Galvin
Secretary

4th July 1984

CURRENT POSITION WITHIN DEPARTMENT

There are at present 14 diagnosed RSI cases in the Department. Eight of these are WPOs, 4 are Steno Secretary Grade 1s, 1 is a Typist Supervisor and 1 a Clerk who has been working on a computer. See attached list.

One WPO and the Typist Supervisor have been off for periods in excess of four months and it appears likely that redeployment is the only option left open to them. One of the Steno Secretaries has been redeployed within the Department.

Excluding the clerk, the other RSI sufferers are endeavouring to return to full time duties after an initial complete rest from work and then gradually being reintroduced to keyboard duties.

RECOMMENDED ACTION TO BE TAKEN BY DEPARTMENT TO ALLEVIATE INCIDENCE OF RSI

ACTION TAKEN	RECOMMENDED ACTION
Rest Breaks	
Keyboard staff to take a break whenever they feel the need i.e. when hands, arms, neck and back become tired or sore. Staff should ideally leave their workstation when taking this break.	Steno Secretaries whose duties are mainly keyboard, encouraged and allowed to take rest breaks. All keyboard staff to do the exercises currently being done within the typing pools. Pamphlets are available to all keyboard staff for this purpose.
Furniture	
An individual assessment of the WP and typing pool workstations was carried out by a union rep who has been assessing and assisting other Government Departments on ways to alleviate RSI. Two of the recommendations were the purchase of gas filled chairs and adjustable desks. There are at present 40 gas filled chairs on order for keyboard staff. These chairs allow complete adjustability for individual operators.	Adjustable desks are also essential. Decisions on the type of furniture should be made without delay and subsequent provision as soon as possible in the new financial year. Ergonomic consultants are available to assist the Department on furniture most suited to our needs.

Re-integration of keyboard Staff	
Two WPOs are currently being given certain duties to perform in Office Services on a job sharing basis i.e. one on keyboard and one working in Office Services.	Keyboard staff returning to duty after leave should always be gradually reintroduced to full time keyboard duties. The Department must therefore determine what other duties are suitable so that keyboard staff are not left in a state of limbo on return to work. Advice can be obtained from various sources e.g. occupational therapists, union.
Management Consultancy have drafted a paper canvassing other duties operators may be able to perform while gradually easing back into full time keyboard work.	
Staff Training Program	
NIL.	Staff, in particular keyboard staff, must be educated on the prevention and early identification of RSI. Staff also need to be educated on the proper use of ergonomic furniture.
	Seminars are conducted by CTHC and various other organisations (e.g. Employment and Industrial Relations, Union, occupational therapists). Videos are also available to use in conjunction with these seminars.
	Seminars should also be conducted to cover the role of management and co-workers in the development of supportive working environments, to help prevent RSI, to ensure full understanding by all staff at all levels and to ensure staff suffering RSI receive appropriate treatment and assistance.

Other Aspects	
There are known cases of WPOs developing cataracts after prolonged exposure to VDU screens. Eye tests should, therefore, be conducted at six monthly intervals.	All operators of VDU equipment have eye tests regularly, the first to be undertaken as soon as possible.
Word Processing equipment should also be regularly tested for radioactive levels. Apparently the older the equipment the higher the radioactive level.	Radiation levels in the Word Processing area be checked regularly. The company providing the equipment should be able to do this.
Due to the problems in recruiting relief staff to back up in the pools the remaining staff are under constant and demanding pressures. The same amount of work is still required to be done but with less staff to cope with the demand.	I have recommended that an advertisement be placed in the local newspaper for temporary keyboard relief so, depending on response, relief is available to the Department on short notice.

Department of Housing and Construction

Minute

ALL STAFF

REPETITION STRAIN INJURY (RSI)

The purpose of this minute is to inform all staff about repetition strain injury, (its effect on Central Office operations) and the steps that are being taken to reduce its incidence and provide assistance to those staff who are at risk.

Repetition strain injury, or occupational overuse disorder, is a painful condition affecting the soft tissues of the neck, shoulders and arms. It can result from repetitive movements and/or stressful fixed postures. Keyboard operators may become susceptible to RSI as a result of excessive or improper use of keyboards; using screen based equipment with inappropriate furniture; adopting incorrect work methods and practices, and working without adequate job training.

The condition is difficult to diagnose but is only reversible if diagnosed and treated in its early stages. At present 20 keyboard operators, including typists and steno-secretaries, representing 27% of the Central Office keyboard resources, have had RSI diagnosed. The consequences of this resource shortage on backlogs and work/flow are obvious and result in increased turnaround time for document preparation and more pressure on remaining keyboard staff.

It is evident that there is no simple or easy solution to the problem. A number of approaches have been initiated including:

1. A concerted effort over recent months to increase recruitment in the keyboard area in order to reduce pressure on remaining keyboard staff.

2. All work stations with word processors have been provided with ergonomically designed furniture.

3. Senior officers have been briefed by medical and physiotherapy specialists on RSI.

4. Typists and steno-secretaries have received specialist advice on RSI; its causes and how to reduce its incidence.

5. A safety Directive (M-SD114) on the safe use of screen-based equipment and a draft Safety Information Sheet (M-SI205) on prevention of RSI have been issued.

6. Arrangements are being finalised to engage occupational and health specialists to assist in on the job training, advice on workstation layout and design and redeployment and rehabilitation of staff.

All staff, particularly those who utilise our keyboard services, can assist by familiarising themselves with the problem and adopting a sympathetic and realistic approach to assisting in its prevention. In particular staff can assist by:

1. Being realistic in your requirements for typing services by including typing time in your overall document production time.

2. Not placing unecessary deadlines on keyboard staff.

3. Respecting the requirement for keyboard operators to take regular breaks from keying. Keyboard operators should not operate keyboards continuously over any period beyond one hour without a regular rest pause. Operators are required to take a 10 minute break from keying after every hour on the keyboard and in most instances they will take their rest break at their normal workstation:

   - a rest room has been established on the 3rd floor, DHC where keyboard staff can with a degree of privacy, undertake exercises designed to assist in the prevention of RSI.

4. Trying to produce the final draft first time instead of relying on keyboard resources to type multiple revisions.

5. Submitting all internal minutes and notes for file, where possible in neat handwriting.

A copy of the Safety Information Sheet "Guidelines for the Prevention of Repetition Strain Injury" is attached. Additional information on RSI can be obtained from Mr David Nettle, Inspector (Safety) on telephone: 477326.

STEPHEN PALYWODA
Assistant Secretary
Industrial Relations and Administration

13 August 1984

SAFETY INFORMATION SHEET M-SI 205

GUIDELINES FOR THE PREVENTION OF REPETITION STRAIN INJURIES

DATE OF ISSUE MAY 1984

SUPERSEDES This is the First Issue

References Central Office File No. H81/2892

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S.J. Palywoda
Assistant Secretary
(Industrial Relations and Administration)

OCCUPATIONAL SAFETY, HEALTH AND WELFARE SECTION

CENTRAL OFFICE

INTERIM ONLY
FINAL — Subject to discussions with Unions

1.0 INTRODUCTION

The performance of many repetitive tasks causes costly but preventable losses of time from work and occasions much discomfort and inefficiency even when there is no loss of time. In small assembly and bench work activities, packaging, data processing, typing, machine accounting, stamping, checking, sorting, etc. the constant repetition of movement imposes a cumulative work load which can cause pain and weakness, and impaired function of the muscles and other soft tissues.

All Manual work requires a combination of voluntary and involuntary muscular movements. Muscles are known to function best and to be least likely to strain when the joints are operating at about the mid point of their normal range of movement.

These Guidelines should be read in conjunction with Safety Directive M-SD114 "Safe Use of Screen Based Equipment".

2.0 CAUSES OF REPETITION STRAIN INJURY (RSI)

Rapid repetition of movement and the muscular power to carry out that movement are basic causes however other factors which could cause RSI are:-

- inefficient work methods;
- movements of hands, arms or trunk which cause the joints to deviate repeatedly and for long periods from their normal functions;
- muscles required to hold loads for long periods;
- prolonged repetitive tasks in too short a period of time.

3.0 SYMPTOMS OF REPETITION STRAIN INJURIES

REPETITIVE STRAIN INJURY (RSI) covers a wide range of injuries associated with the overuse of muscles and tendons which generally occur in the fingers, hand, arm, shoulder and/or neck. The most commonly diagnosed injuries are Tenosynovitis and Carpal Tunnel Syndrome, but include Tendonitis, Ganglion, Synovitis Bursitis, Quervain's disease, Epicondytitis, Tennis Elbow and various other shoulder, neck, back, arm and wrist strain injuries.

It is essential that early symptoms be recognised by the sufferer and immediately reported to their Supervisor. At first these symptoms may seem trivial, but if recognised early and acted on further development of the injury can be prevented and no permanent damage will result. If the symptoms are ignored permanent damage may occur. Symptoms include:

- excessive muscle fatigue and soreness;
- pain, swelling, numbness and/or tingling of the hand, wrist or forearm;
- pain or weakness in the muscles of the arms, shoulders or neck;
- crackling sound, with creaking sensation in affected area when moved.

It is important that all employees understand the personal consequences in terms of pain, incapacitation and decreasing opportunities for successful redeployment if they work on regardless until the condition becomes fully embedded. It is equally important that supervisors at all levels understand the loss in terms of productivity and increased staffing overheads and administration costs if symptoms are played down or ignored.

Avoidance or minimisation of RSI requires close consultation and a high level of confidence to exist between employees, supervisors and management.

4.0 PREVENTION

To prevent repetition strain injuries it is necessary to carefully investigate each workplace and consider the following points:

- Design of Equipment used
- Layout of Workplace
- Rate at which the work is performed
- Posture of Worker
- Design of the task to be performed.

Any one or all of these may need to be corrected to prevent these injuries occurring, the medical point of view being that prevention is possible if prompt action is taken. Policies must be written which will enable preventative and curative measures to be taken.

Prevention will necessarily include the following measures:-

- Supply of adjustable chairs, desks and document holders for all keyboard operators personal needs
- Training of all new workers in safe working methods. This must be carried out by supervisors on a regular basis. (Supervisors will need specialist training to carry out this function.)
- Instruct supervisors and workers of causes of and ways to prevent RSI
- Enforce required rest periods and changes of tasks
- Curtail all overtime worked on repetitive tasks
- Early reporting of muscle pain or weakness
- Rotation of workers with R.S.I. to alternative safe work (e.g. clerical work)
- Regular medical checks for all persons with even hinted RSI.

5.0 GENERAL RESPONSIBILITIES

5.1 EMPLOYEES

All employees should:-

- be aware of correct posture and be conscious of retaining correct posture throughout the working day;
- understand the value of maintaining a generally good level of physical fitness in minimising RSI risk;
- advise Supervisor immediately of any injury received (work or otherwise e.g. sport or car accident) which may affect ability to undertake normal duties or which may be aggravated by undertaking normal duties;
- report to Supervisor any equipment, furniture or workstation fault which inhibits correct posture or proper performance of normal duties;
- know how to recognise the early symptoms of RSI. Report such symptoms to Supervisor immediately. A sore neck or wrist is not an unusual event and a sensible approach to proper treatment by resting the affected area for a short while (1-2 days) will usually see the problem quickly clear. To press on regardless will only aggravate the situation and will increase the risk of RSI. Employees with RSI symptoms should not take pain killers in order to keep working.

If symptoms do not disappear with rest (i.e. alternative duties which rest the area affected), advise your Supervisor and consult your doctor. Similarly, medical advice should be sought if the symptoms do disappear with rest but recur on resumption of work.

Employees consulting their general practitioner should not feel shy about querying him on his knowledge of repetitive strain injury and obtaining a referral to a specialist, if appropriate.

5.2 SUPERVISORS

All Supervisors should observe the following:-

- the need for a high level of awareness of RSI;
- to consult and maintain close liaison with specialists in support groups on what contributes to its occurrence;
- encourage work practices or procedures necessary to minimise occurrences;

  realise the importance of recognising early symptoms and identifying staff at risk and acting immediately to ensure symptoms are not aggravated;
- the proper instruction of all staff in the causes of RSI and in the methods for avoiding it. New staff seeking higher proficiency rating and staff returning after an absence of some months are particularly vulnerable to RSI and need to be closely monitored;

- the need to instruct employees in correct posture and ensure adjustment of furniture and equipment to suit each person;
- the resolution of problems with furniture and/or equipment which inhibit correct posture or proper performance of normal duties;
- a requirement to liaise with employees on appropriate rest pauses.

All possible cases of RSI should be reported to the Safety Officer and the Supervisor. They should then liaise with all parties involved to ensure appropriate action is taken to avoid any aggravation of the injury.

Supervisors with outposted employees need to monitor their workloads closely as it is not unknown for sustained pressure to be placed on such employees for quick turnaround of work which will unknowingly place them at unnecessary risk.

5.3 MANAGEMENT

Management procedures should:-

- encourage employees to report RSI symptoms immediately;
- emphasise need to quickly transfer RSI or possible RSI sufferers to other duties which allow the affected muscles etc to be rested until the situation is clarified;
- include maintenance of specific records on RSI to:
  - facilitate monitoring of occurrences by location, type, length of duration etc;
  - test effectiveness of preventative and rehabilitative measures;
  - provide appropriate feedback to senior management, line management and the Departmental Safety Committees.

Records kept should include an accident report to management on each new case. This is aimed at identifying the particular factors most likely to have led to the onset of RSI symptoms and allows Safety Officers to carry out preventative action. A summary of these reports should be presented to all levels of Safety Committees throughout the department for appropriate action.

6.0 KEYBOARD OPERATORS

6.1 Keystroke Rates

CONTINUOUS keyboard operation at excessively high key stroke rates may expose operators to RSI.

To set appropriate keystrokes ranges per hour requires consideration of a wide variety of factors which vary between locations e.g. age of machine, type of work, whether one or two hands are used etc.

Supervisors and keyboard operators should consult, as needed, on appropriate keystroke ranges for the work being done, taking into consideration local factors. The keystroke range adopted should allow operators to work at a comfortable, natural rhythm rather than any sustained forced pace.

6.2 Rest Breaks

There are two definitions of rest breaks:

- A regular change in work or task (i.e. a mix of duties or job rotation which provides breaks from continuous keyboard operation e.g. the typist who is also telephone receptionist, and assists in general office duties).
- A complete rest from any work activity.

The second definition applies if the particular job allows no relief from continuous keyboard operation in the form of alternative duties (job rotation).

While the issue of rest breaks lies between the Supervisor and the Operator, employees should not operate keyboards continuously over any period beyond one hour without a regular rest pause. It is also essential that rest breaks are regularly spaced throughout the work day. In no sense are they a leave credit to be accumulated.

6.3 OVERTIME

Supervisors and keyboard staff need to be aware of the added risk of RSI by extending the hours of keyboard operation beyond normal daily working hours i.e. there is a strong case for overtime to be limited to weekends.

Given the associated risks of extending normal hours Supervisors should apply strict tests of essentiality before requiring keyboard operators to work evening overtime. Under no circumstances should keyboard staff who have had some history of RSI or possible RSI be required to work overtime beyond normal daily hours.

7.0 REFERENCES

- Repetition Strain Injuries - Approved Occupational Health Guide. National Health and Medical Research Council. June 1982.
- Injury by Repetition - The Costs are High. Work and People Vol. 8 No 1 1982. Department of Employment and Industrial Relations.
- VDU's at work. Occupational Safety and Health. Working Environment Series 13. Department of Science and Technology. 1981.
- Guidelines for the prevention of repetitive strain injury (RSI). ACTU-VTHC Occupational Health and Safety Unit. August 1982.
- Guidelines for Working with Screen Based Equipment. ACTU-VTHC Occupational Health and Safety Unit. May 1982.
- APSA POLICY ON REPETITION INJURIES. APSA REVIEW JUNE 1982.
- Tenosynovitis-overuse problems. Workers Health Centre, Lidcombe, Info. Leaflet No 1. November 1980.
- The cost to industry of tenosynovitis and related diseases associated with repetitive work. K.N. Baidya and M.G. Stevenson (Associate Professor). School of Mechanical and Industrial Engineering. University of NSW. 1982.
- Determination No 327 of 1983 (26 August 1983 made by the Acting Public Service Arbitrator in respect of data preparation officers in the Australian Tax Office).
- Report on Accommodation for Screen Based Equipment in Central Office Locations - Department of Housing and Construction - J. Frith and D. Hughes - 1984.

ADMINISTRATIVE CIRCULAR

Department of Science and Technology · Canberra

No. 2/84 File 83/1430 Date 25 May 1984

DEPARTMENTAL POLICY ON SCREEN-BASED EQUIPMENT

All Staff To See

Attached is a Departmental policy statement on the operation of screen-based equipment (SBE). The policy was developed in consultation with staff associations and has been endorsed by the Safety Policy Committee.

The policy recognises the Department's obligation to provide a safe and ergonomically sound working environment for SBE users. The Department is committed to achieving optimum conditions as described in the policy, although it should be noted that it will take some time to implement some aspects of the policy.

With the high level of interest being shown in the many aspects of SBE policies by Government agencies and staff associations, the Department recognises the need to keep this policy under review. It is intended that the Safety Policy Committee examine this matter again later in the year in the light of operational experience and other relevant information available at that time.

W/J/McG Tegart
Secretary

DST POLICY ON THE OPERATION
OF SCREEN BASED EQUIPMENT

INTRODUCTION

1 This statement is designed to establish firm guidelines for staff who use Screen Based Equipment (SBE) and for officers responsible for the acquisition and accommodation of SBE and associated furniture, fittings and support services. In developing this statement regard has been given to PSB Memorandum 81/418 "Operation of Visual Display Units (VDUs) and other Screen Based Equipment (SBE)", as well as to guidelines and policies of other Government departments and agencies and of staff associations (see Attachment 1).

DEFINITION

2 SBE is defined as equipment which has a screen of any type which emits an illuminated display as an integral part of its operation, e.g. visual display units and terminals, screen-based word processing equipment and micrographics equipment.

CONSULTATION WITH STAFF/STAFF ASSOCIATIONS

3 Where consideration is being given to the acquisition of new or replacement SBE, this policy should form the basis of any consultations with staff associations on ergonomic and occupational safety and health considerations. Staff should be invited and encouraged to participate in the selection of equipment, accommodation matters and planning aspects of job tasks such as training and rest breaks.

SCOPE

4 While this policy is intended to be of a broad nature, it covers the following elements of the job in any SBE workplace:

- hardware
- physical environment
- job task(s)
- operator
- organisation

Consideration of these elements in this document is not intended to be comprehensive, but is intended to focus attention on the need for optimum operator comfort consistent with efficient operation of the equipment. Other aspects which should be considered are detailed in a number of publications, some of which are referred to in Attachment 1.

5 HARDWARE

5.1 When purchase of SBE is being considered, consideration should be given to such matters as character size, row spacing, screen colour, colour contrast, keyboard design etc. The equipment should feature such characteristics as the following:

- the image on the screen should be clear and stable the space between rows should be at least equal to the character height;
- it should be possible to distinguish easily between similar characters, such as M and N, C and G, I and 1;
- the keyboard should be detachable from the screen so that operators can move it to the most comfortable position for posture and viewing distance from the screen;
- a screen height adjustment mechanism should be provided;
- the surface of key-tops should have a matt finish to reduce reflections and to provide a non-slip target;
- a square key-top size of 12-15 mm with an intercentre spacing of 18-20 mm;
- all SBE including microfiche readers should have matt screen finishes to counter reflections.

5.2 Electrical cables are a potential cause of mishaps. Cables from equipment should conform with the appropriate safety regulations, and where possible be accessible only by tradespersons in the course of installation, maintenance or repair. The use of extension leads that criss-cross the work area poses safety problems and should not occur. Power outlets should be positioned in such a manner to prevent accidents from occurring.

6 PHYSICAL ENVIRONMENT

Characteristics of the physical environment include accommodation, work stations (chairs, desks and document holders), lighting, noise, and climate/air conditioning.

6.1 Accommodation aspects to be considered include the following:

- the provision of curtains, which protect against glare and contribute to noise insulation and absorption;
- the provision of anti-static carpet;
- the placement of the workstation so that the operator's line of vision is not affected by glare.

6.2 Workstations. Figure 1, on the next page, illustrates the preferred work posture and workstation layout as recommended by the National Health and Medical Research Council. It should be noted that the upper arm should make an angle of more than 90° with the forearm.

6.2.1 Chairs should be easily adjusted so that seat height in the range of 376 mm-478 mm can be attained; they should be freely movable and have five legs for stability. The back rest should be adjustable for lumbar support. Footrests may assist some operators in achieving correct posture.

6.2.2 Desks should also be easily adjusted to provide a home key height in the range of 600 mm-760 mm while ensuring there is sufficient knee and leg room. The working surface should be of a matt finish to minimise glare; it should be large enough to incorporate a screen, keyboard, source document and working paper and allow the equipment to be moved as required by the operator.

6.2.3 Document Holders are desirable for keyboard work, with or without a screen, as they enable the source documents to be placed -

i so that the worker can comfortably read them, without bending the neck too far; or

ii so that the screen and source documents are in the same focal plane and at the same level

and so reduce the strain on the neck which occurs when source documents are flat on the desk and the screen at an angle in front of the worker.

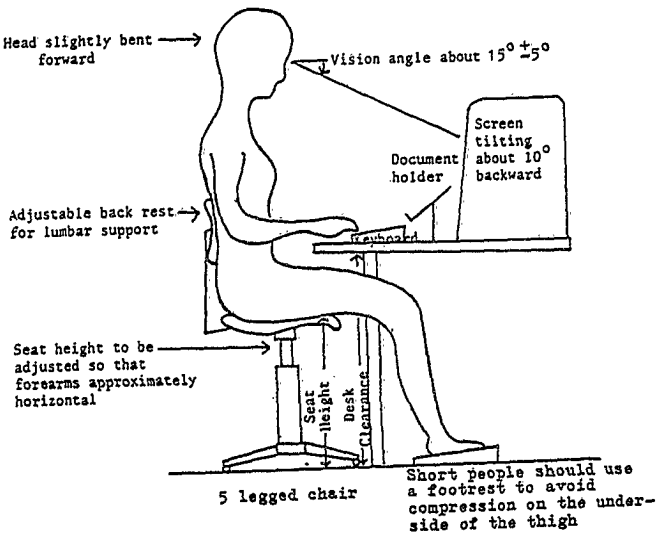
6.3 Lighting. The illuminance throughout the work area should be reasonably uniform and in the range of 150-300 lux. Adequate provision must be made for the control of glare and/or reflection from natural lighting (e.g. by provision of curtains, and/or screens) and from overhead luminaires (e.g. by opaque covers).

6.4 Noise level in the work place should be kept below 65dBA, and where concentration is required, it should be below 55dBA. Impact printers, tape drives, telex machines and other noisy equipment should be sound insulated and/or separated from the keyboard workplace.

6.5 Climate/Air Conditioning. The work area should be air-conditioned with the temperature maintained between 200-250C, and the relative humidity between 45-55%. VDE can generate uncomfortable heat levels, so it is important to ensure that an even temperature is maintained throughout the workplace while also maintaining minimal air movement.

Figure 1

PREFERRED WORK POSTURE



7 JOB TASKS

7.1 Training is an essential aspect and should include ergonomic principles associated with work stations and safety and health aspects of the equipment and the work stations. Training should also provide the opportunity for operators to learn new skills/become multiskilled in SBE operation.

7.2 Rate of Work. While clear and realistic goals are important to planning, the setting of a particular rate of work for a task is undesirable because it places stress on the worker involved and may lead to serious health problems such as repetition injuries, eg tenosynovitis.

7.3 Work Routine/Job Design

7.3.1 Variety in elements of an operators job is encouraged, particularly where other identifiable, meaningful tasks can be incorporated.

7.3.2 Rest Breaks should be taken on a regular basis to alleviate visual and postural fatigue. If operators are employed substantially full-time on SBE, then rest breaks should be taken at least once an hour. If, however, SBE work is one of several tasks performed during the day then a break after two hours is required. Such breaks should allow the operator to leave the work station and may consist of or be supplemented by engaging in other tasks as noted above.

8 OPERATOR

A safe and healthy workplace is one in which the matters covered earlier are ideally matched to the needs of the individual operating SBE. However, monitoring of the health of SBE operators is essential to ensure the personal and medical well-being of operators.

8.1 Eyesight Testing has been recommended by the NH&MRC for operators of SBE as follows:

- on commencement of work with VDU's
- at two yearly intervals after the age of 40 years
- whenever indicated by the onset of symptoms.

SBE operators may obtain further information on the nature of the tests and arrange for testing in line with the above criteria by contacting their Personnel Officer.

8.2 Postural Fatigue, Repetitive Strain Injury, etc are problems which can be minimised by regular rest breaks, optimum work-station ergonomics and incorporation of a variety of tasks into the job design. These matters should be kept in mind and operators should notify their supervisor and seek medical advice whenever they experience symptoms of injury to the neck, shoulders, back, arms, wrists, hands, etc.

8.3 Compensation Aspects. Instances of fatigue, postural and/or visual problems may, if not rectified, lead to compensable conditions arising from the working conditions. It is in the fundamental interests of employees and management that such conditions and their consequent incapacities be prevented as far as practicable.

8.4 Radiation Levels. There has been conjecture in some quarters for some years over the effects of SBE on pregnant operators. The results of extensive testing by such authorities as the Australian Radiation Laboratory indicate that the low levels of radiation emitted by SBE do not pose a hazard to operators. However, the Department will consider sympathetically any requests from pregnant operators not to work on SBE during pregnancy.

9 ORGANISATIONAL IMPLICATIONS

As well as the matters covered earlier, consideration should be given to the organisational implications of the acquisition of SBE.

ATTACHMENT 1

REFERENCES

1 PSB Memorandum 81/418 of 23 October 1981 "Operation of Visual Display Units (VDUs) and other Screen Based Equipment (SBE)"

2 National Health and Medical Research Council Approved Occupational Health Guide - Visual Display Units (adopted June 1982)

3 Occupational Safety and Health Working Environment Series 13 "VDUs at Work" (1981)

4 ACTU-VTHC Health and Safety Bulletin Number 12 "Guidelines for Working with Screen-Based Equipment" (May 1982)

5 APSA Policy for Safe and Healthy Keyboard and Screen Environments "A Safe and Healthy Job?" (April 1983)

6 Codes of Practice under the Code of General Principles a Occupational Safety and Health in Australian Government Employment:

202 Ventilation and Thermal Control
203 Lighting and Interior Colour
206 Offices

7 Cakir, A., Hart, D.J., Stewart, T.F.M., "The VDT Manual" (1980)

8 ACOA Policy on SBE

DEPARTMENT OF
TRANSPORT

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SENIOR OFFICERS MEETING

REPETITION STRAIN INJURY

The Central Office of this department has over the last fortnight experienced an outbreak of tenosynovitis in the keyboard group

- of some 60-odd staff (full-time and part-time) 7 are on leave (generally for periods of up to three weeks) and there are other suspected cases

- it appears that to some extent the incidence of the condition has until recently gone unrecognised, and we are currently seeking to identify all possible cases

- it is likely that the current outbreak has arisen in part at least due to increased workload pressures in Divisions at this time i.e. pressures related to the Budget.

In response to the problem we are taking the following action

- keyboard staff displaying tenosynovitis symtoms are encouraged to seek medical advice and attention

  : we are also seeking assistance from a private group known as the Tenosynovitis Support Group

- in accordance with advice from the Capital Territory Health Commission and other experts, keyboard staff are being encouraged to take regular rest breaks and to do exercises (unfortunately it appears that workload pressures at times make this difficult)

- meetings are being arranged with keyboard staff to inform them of what is happening and to instruct them on appropriate preventive and remedial action

- information papers on tenosynovitis are being prepared and will be conveyed to staff via staff circulars, MASA meetings etc

- in appropriate cases, affected keyboard staff will be redeployed to non-keyboard duties.

Preventive Action in Divisions

Meetings are to be arranged with Divisional and Branch Heads to convey to them the nature and extent of the problem and its implications for Divisional/Branch operations

- we must reduce keyboard workload and pressures on keyboard staff e.g. by eliminating unnecessary typing, discouraging excessive re-typing, and encouraging greater acceptance of hand-written minutes or drafts with handwritten amendments

- we will also have to modify the practice of using Steno-Secretaries as branch typists in addition to their normal Steno-Secretary duties

- keyboard staff must be allowed and encouraged to take recommended restbreaks from keyboard work.

Recruitment of Keyboard Staff

Keyboard staff are in short supply and high demand especially in Canberra

- recruitment difficulties are aggravated by the widespread incidence of tenosynovitis in Canberra

- as part of ongoing recruitment action we will be looking seriously at trying to recruit keyboard staff from interstate and we will need to consider taking on more part-timers

- the Department has made representations to the PSB about salary rates for keyboard staff and salary relativities within the keyboard group ie a Steno Secretary G1 has only a small margin over a Word Processing Typist G1

- relaxation of qualifications requirements for entry into the clerical-administrative structure, whereby unqualified staff with 5 years service may now apply for clerical-administrative positions, has meant that keyboard staff are moving out of keyboard work into clerical work.

Job Redesign

- The PSB is currently doing a broadranging review of keyboard structures including job design aspects

  - is aware that job redesign may help to alleviate RSI problem, e.g. by creating jobs combining clerical and keyboard work, thereby reducing amount of keyboard work by individual operators.

Manpower Branch
13 July 1984

SELECTED AUSTRALIAN RESEARCH

Australasian College of Physical Scientists in Medicine

Quality Control & Safety Topic Group

Chairman :-
W.M. Burch

Address
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PREAMBLE

The original version of this document was written at the request of an informally constituted body known as the ACT Occupational Health and Safety Action Group. The idea was to transmit it to the Interim Occupational Health and Safety Commission established by the Federal Government. Its genesis lay in an attempt to deflect the concern of workers, unions and management away from nonexistant issues relating to VDT's, namely radiation hazards, to other, possibly more fruitful, investigations.

In 1978 a reported spate of spontaneous miscarriages among VDT operators in a Bank in South Australia was originally attributed to radiation effects. I was working with Visual Evoked Responses (VER's) and other aspects of neurophysiology at the time, and it seemed a reasonable proposition to investigate the possible ill effects of prolonged visual stimulus by patterns and flickering light with reported unpleasant side effects from VDT's. Given the brain's capacity to synthesise extremely potent drugs (encephalins, endorphins), it seemed at least plausible that this link could be made. The following was written, therefore, in as non-technical a style as possible for a presumed lay audience.

When called before the Joint House Public Accounts Committee of the Parliament to present evidence on the radiation hazard aspect of VDT's, I submitted the following material as background to the hypothesis that we should be looking at a visual light to brain interaction for the observed effects. I have now been asked by the Parliamentary Committee to locate experts in the field of neurophysiology who would provide independent comment on this hypothesis. Their time scale is fairly short because if it is felt worth pursuing, the Committee will commission a full investigation by an appropriate organisation.

VDT HAZARDS - AN HYPOTHESIS

We have evolved in a D.C. light environment, that rises and sets daily and can be shown to have induced a circadian rhythm, an approximately 24 hour clock, in individual functioning cells. Some systemic effects are most readily appreciated by international travellers and collectively called "Jet-lag". Now the eye is often referred to as the window to the brain. Light stimuli are converted in the back of the eye to minute electrical pulses which travel down thousands of individual nerves to the "vision processing" part of the brain near the back (the occipital region). But these pulses do not travel directly; they pass through a series of relay stations (synapses) on the way,

and at each relay station they are boosted and modified somewhat. The need for and function of these relays and amplifiers is not known, but they can be seen functioning by detecting the pulses which appear as minute electrical signals on the scalp. A complete battery of diagnostic tests has grown up in the last few years, recording these "evoked responses" (E.R's.) from the scalp, and relating them to neurological disorders.

Superimposed on these tiny pulses that relate back to individual stimuli (i.e. light flashes) on the eye, is the continuum of electrical activity which exemplifies brain function. In a clinical setting, when this activity is recorded for diagnostic purposes it is called an electroencephalogram (E.E.G.).

E.E.G. waveforms are most complex and only a few parameters have been identifiably correlated to disease states, particularly epilepsy. As with the E.R. signals, they are detected on the scalp from electrodes but have an amplitude hundreds of times larger that E.R.'s. An E.E.G. would seem to represent a summation of brain activity, and in clinically evident diseases, i.e. epilepsy, a grossly abnormal pattern can be discerned, or even evoked with flickering light. Clinically evident symptoms of convulsions induced even by a normally functioning television set are known in a small number of photosensitive persons and the syndrome "TV epilepsy" is well documented. Given a broad definiton of "photosensitivity" which includes transient, unusual responses to intermittent light, it has been shown that one in ten normal adults and up to one in three children are included. Therefore it seems to me a reasonable hypothesis to suppose that there is an entire spectrum of effects due to flickering light running all the way from frank convulsions, through headaches, euphoria, depression, absences, down to nothing in a normal population. The concept of only two sets: (1) photosensitive epilepsy, 0.06% of the population, and (2) the rest of us, seems naive and merely indicates that we have not asked the right questions in relation to problems of VDT's.

The following facts relate to "photosensitive" persons who exhibit a transient effect on their E.E.G. pattern, i.e. a disturbance monitored by a relatively crude "whole brain" measurement.

1. Photosensitivity is increased or appears after sleep-deprivation.

2. Consistent circadian fluctuations in sensitivity have been observed, and in women, fluctuation correlating with the menstrual cycle.

3. Despite the knowledge that conscious "flicker-fusion" occurs roughly 18 cycles (flashes) per second (18Hz), studies show a peak photosensitivity at 20Hz and running out as far as 60Hz.

4. Although conscious perception of flicker is more significant peripherally, photosensitivity is exactly the converse.

5. In some persons, static patterns are sufficient to induce an E.E.G. response.

6. Pattern sensitivity rises to 2/3 of the photosensitive population, when a pattern of lines oscillated periodically at right angles to the line direction, peaking at 10-20Hz.

7. The spatial frequency of lines of text may fall within the peak values for photosensitive persons(1-4 cycles/deg.).

8. The E.E.G. effect lasts less than 3 seconds and usually produces no detectable sign for the person although some described a sensation of shock.

Of overriding importance in appreciating the effects listed above is that (a) all these tests were conducted on persons whose visual system was completely normal in terms of all standard medical criteria and (b) the stimuli were only of a few minutes duration at most. By comparison, a VDT operator spends many hours concentrating on a light source composed principally of horizontal lines, refreshed (flickering) at 25Hz.

ACTION: There are several avenues by which much of this inferential material can be tested for validity, and if a link between VDT operation and mental/physical disorder is found, there are ways to eliminate the flickering light without substantially increasing the cost of VDT's. Some effects may be caused by malfunctioning systems or very brief "flashes" that are below the conscious threshold, but nevertheless, if repeated, can trigger a symptom in the operator. These are easily tested for with relatively simple apparatus. As a first step, where mental/physical disorders (other than repetition strain injury) are reported, I recommend a regime of monocular operation be tried, by getting the operator to wear a patch over one eye, alternating every ten minutes with the other eye. There is a dramatic attenuation of photosensitivity that goes way beyond what would be expected by additive effects. A diminuation or elimination of symptoms by this simple, if slightly inconvenient, manoeuvre would build a strong case for the hypothesis. Further action should perhaps await the outcome of this first step, in case the hypothesis fails. I am willing to elaborate on a range of activities that would delineate, then remedy the cause of this transient, but temporarily disabling new occupational health hazard if it is felt worth pursuing.

Main Reference: "VISUALLY-INDUCED SEIZURES" by A J Wilkins, C D Binnie and C E Darby, 1980 Progress in Neurobiology Vol 15, 85-117.
Also: "STRESSLESS USE OF VDU'S" by J Manos, 1980 Health and Safety at Work, August.
"VISUAL DISPLAY UNITS" by M R Harrison, 1983, Aust. J Ophthalmol. Vol. 11, 39-41.

W M Burch
Medical Physicist.
6 June 1984.

28th August, 1984

FOR PRESENTATION BY PROFESSOR F.C. HOLLOWS TO THE SELECT PARLIAMENTARY COMMITTEE ON THE USE OF VISUAL DISPLAY UNITS (VDU's) IN AUSTRALIA

Whereas:

1. I know of reports of eye symptoms from people who use VDU's (1)

2. and I am aware of reports of cases of cataract that have followed VDU use (2)

3. I am aware of cataract that is associated with microwave radiation from radar devices (3)

4. I have had experience of cases of cataract that appears to have been associated with VDU use,

5. and I am aware of reports that cataract from long wave length radiant energy is considered to occur as a posterior subcapsular cataract (4),

6. and I am aware that this type of cataract occurs in many conditions and that there may be many causes of this type of cataract (5).

7. I know that cataract or opacification of the human lens may or may not be increasing but the incidence of cataract extraction appears to be increasing in New South Wales and the United States of America (6 & 7).

8. I know that the real incidence of premature cataract, i.e. cataract occurring in persons under the age of sixty is not known and

9. I am aware that VDU's emit radiant energy and I am aware that VDU's and television screens have been known to emit x-rays (8 & 9).

10. I know that some VDU's may emit the longer wave length ultraviolet light, the so-called UVA wave length 295 to 400 nan metres. I am aware of the possibility that such UVA as emitted by fluorescent tubes is associated with an apparent increase in some forms of malignant melanoma in Australian females (10, 11, 12, 13 & 14).

11. I know that VDU's have been known to emit waves of low frequency and ultra low frequency and I am aware that the flyback transformer can emit ultra low frequency radiation (15).

12. I know that VDU's have become prevalent in many work situations and that in such situations VDU's do not carry certification of the measurements of their irradiance nor is the irradiance specified over the whole of the electromagnetic spectrum.

13. I know that work situations may be subjected to irradiation due to the number of VDU's.

14. I know that the occupational microwave standard in the USA is 10 mw/cm^2 and this exceeds natural background rate by a factor of 10^9 and if man-made background radiation intensities are included the exposure standard will be approximately 10^4 to 10^6 times higher than natural plus man-made background intensities (16).

15. I am aware of reports of clusters of reproductive defects that have occurred in VDU operators and that such studies have not proven conclusively that VDU operation has been responsible for the reproductive defects or that VDU operation is completely independent of such defects and I know of the reason for concern about this matter (17).

16. I know that the frequency of radiation that can be demonstrated to have a biological effect appears to be increasing, and that radiant energy previously thought to be of no biological significance in the human environment is now considered to have potential danger.

17. I know of the uncertainty as to whether or not long term repeated doses of subthermal microwaves can cause cataract. Such repeated small doses of subthermal microwave irradiation may or may not cause cataract (4).

18. I am aware of the increasing length of the latent period that elapses between the exposure to radiant energy and the onset of physical defect, especially the now accepted fact that radiation cataract can occur decades after exposure, whereas previously the latent period was considered to be in months or years (18).

19. I have carried out a study of persons in Australia who could possibly have been exposed to microwave and very low frequency radiant energy and found when compared to controls of the same age and domicile that they have more posterior subcapsular cataract (9).

CONCLUSIONS:

Because there is so much that is not known and because doubt exists as to the safety or otherwise of instruments and machines that emit radiation that a conservative approach is in order. In such circumstances it is prudent that examination and certification of the health or disease or state of damage to the eyes of persons in occupations where such radiation may be experienced be done by medical persons skilled at ocular examination and fully familiar with the range of pathological entities that may affect the visual system. I am of the opinion that long-term ophthalmological and epidemiological studies of large numbers of people is necessary to provide certainty regarding the safety or otherwise of VDU use.

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References:

1. Nishiyma, K., et al. (1983) Proceedings for International scientific conference on ergonomic and health aspects in modern offices, Torino, November 7-9, 1983.

2. Zaret, M.M. (1980) Cataracts and visual display units. In Conference on health hazards of VDUs, Loughborough, England, December 11, 1980, Proceedings. Case 6.

3. Aurell, E. and Tengroth, B. (1973) Lenticular and retinal changes secondary to microwave exposure, Acta Ophthalmol. (Kbh). 51, 764-771.

4. Carpenter, R.L. (1968) The action of microwave radiation on the eye. J Microwave Power. 3, 3-19.

5. Pau. H. (1976 Die Häufigkeit der verschiedenen Formen de Alterskatarakt. Klin Monatsbl. Augenheilkd. 169 158-164.

6. Australian Bureau of Statistics (1983) Cataract extractions - N.S.W. 1978-1981 by age and sex.

7. Nadler, D.J. and Schwartz, B. (1980) Cataract surgery in the United States 1968-1976. A descriptive epidemiologic study. Ophthalmology (Rochester). 87, 10-18.

8. Weiss, M.M. and Petersen, R.C. (1979) Electromagnetic radiation emitted from video computer terminals. Am. Ind. Hyg. Assoc. J, 40, 300-309.

9. Nashel, D.J. et al, (1982) Radiation hazard of video screens. N. Engl. J. Med. 307, 891.

10. Lerman, S. (1980) Radiant energy and the eye. New York, McMillan. 164.

11. Zigman, S. (1977) Near UV light and cataracts. Photochem Photobiol. 26, 437-441.

12. Beral, V., et al (1982) Melanoma and exposure to fluorescent lighting at work. Lancet, 2, 290-293.

13. Maxwell, K.J. and Elwood, J.M. (1983) UV Radiation from fluorescent lights. Lancet, 2, 579.

14. Pasternack, B.S., et al. (1983) Malignant melanoma and exposure to fluorescent lighting at work. Lancet, 1, 704.

15. Radiation Environmental Management Systems Inc., Ontario, Canada (1982) Report on video display terminals.

16. Cleary, S.F., (1970) Biological effects of microwave and radiofrequency radiation. CRC Crit. Rev. Environ. Control, 121-165.

17. Canadian Centre for Occupational Health and Safety, Hamilton, Ontario (1983) Report on reproductive hazards and VDTs.

18. Lerman, S. (1980), ibid, 286.

19. HOLLOWS, F.C. and Douglas, J.B. (1984) Microwave Cataract in Radiolinemen and Controls. Lancet, August 18, 1984.

RESTRUCTURING THE WORKPLACE FOR KEYBOARD WORKERS

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INTRODUCTION

This paper takes occupational health problems as the starting point to explore the issue of restructuring the workplace for keyboard workers.

For the purposes of this paper "keyboard workers" refers to workers such as typists, stenographers, secretaries, data-processing operators, word processing operators, accounting machinists and other groups such as office or clerical assistants for whom keyboard operation is a significant part of their work and a significant determinant of the pay and conditions under which they work.

Many of these workers already operate screen-based equipment (SBE). Many more are likely to do so. Whether they operate SBE or not, they share many facets of their work and of the structure and organisation of their work and problems. Another paper in this section by Kerry Liddicoat sets out the health implications of screen-based equipment for women workers. Many of these health implications also apply to other keyboard workers and have existed for a long time but have been ignored or neglected.

One of the reasons for this is the little attention paid to occupational health generally. It is only in the last few years that occupational health, safety and welfare have become major issues and areas of interest for many individuals and organisations, not least of which are unions.

The emergence of occupational health as an industrial relations issue has occurred at the same time as far-reaching technological change in the office. The basic premise of this paper is that the effects of technological change on keyboard workers and the incidence of serious health problems are indicative of both the need for and the opportunity for a fundamental reassessment of keyboard work. One of the possible, and I suggest desirable, outcomes would be a restructuring of the workplace for keyboard workers.

Framework of the paper

The first section sets out responses to technological change and occupational health issues. Many of these responses have positive aspects which could be built on to achieve improvements for keyboard workers. There are however serious limitations which are also indicated.

Many of the problems experienced by keyboard workers are interrelated and any approach to occupational health problems which fails to take into account these interrelationships is unlikely to be effective. In the second section I explore a number of factors in keyboard work, particularly in the structure and organisation of that work, and in the working lives of keyboard workers which are relevant to technological change and occupational health. Because these broader issues have been largely neglected in both health and industrial reactions to health problems, the likelihood of occupationally healthy work for keyboard employees is limited.

The importance of equal employment opportunity measures is discussed in the next section. The final section, concepts and strategies, indicates other concepts and ideas which should underlie a restructuring of keyboard work, some aspects of restructuring and strategies to bring about the proposed changes.

Response to technological change and occupational health

The effect of significant technological change and serious occupational health problems in the office has been to focus both union and management attention on facets of office work largely neglected before and on the development of procedures and practices which could have significant effects on the nature of keyboard work.

The renewed general interest in occupational health is being reflected in a number of measures which could be beneficial to keyboard workers.

The very strong involvement of the union movement in these measures signifies the importance of union activity for the health of keyboard workers but this has not been fully realised by any means. Examples of the steps being taken generally in relation to occupational health include the following. A National Interim Commission on Occupational Health and Safety has been established by the Commonwealth Government. New occupational health and safety legislation has been introduced in several States and proposed in others. A notable feature of this legislation is the increased role and powers for worker - appointed safety representatives to act on "unsafe" working conditions. An ACTU and Victorian Trades Hall Council (VTHC) Occupational Health and Safety Unit was set up in 1981 to:

(i) provide an information service to unions, including the preparation of basic readable and instructive safety information for unions and individual members;
(ii) review, in conjunction with unions existing occupational health standards;
(iii) represent unions in the examination of occupational health standards;
(iv) initiate surveys, in conjunction with relevant authorities, on general and specific health problems, and
(v) liaise with Federal and State government authorities on information, research development and union initiatives.

Many unions have generally increased their interest and involvement in occupational health matters by various means such as internal committees, appointment of safety officers, training for members and officials, etc.

Among the most important aspects of the current upsurge in interest has been the change in emphasis away from compensation to prevention. ACTU policy on occupational health is that specific policies to be adopted by unions should include as a first priority the elimination of workplace hazards or dangers and the refusal to accept payment for adopting hazardous or dangerous working practices.

A major problem in all this is the obvious fact that it is much easier to focus on immediate and obvious "hazards" or "dangers" at work than to deal with health problems that are the result of a complex of conditions and working practices, and which develop over a long time.

Repetition strain injury is clearly on the agenda as an important issue of this kind. However the general strategies of the union movement may not be all that useful if those workers being affected are not members of unions or are members of unions which will not take a strong stand or whose ability to take a strong stand is limited by the relative isolation of members in small office situations. A great deal also depends on the individual workers' perceptions of the union's role in working for them. If they do not see it as relevant or they perceive the union's involment as likely to achieve little they will not join or will not call on the union for assistance. Many in fact see the union's involvement with some justification, as likely to get them into a lot of personal hassles even to the extent of losing their jobs. These kinds of attitudes are additional to the personal feelings of power or powerlessness as set out by Ros Byrne in her paper in this section of ANZAAS.

With the help of a CEP grant the TPSA is about to conduct a survey of our female members including questions on their attitudes to the union. The project is part of a general push to increase the involvement of women in all aspects of the union's activities and to improve services to the most disadvantaged of our members. Few keyboard workers seek our assistance and one of our aims is to test a number of hypotheses about why that is so.

A problem for unions has been developing their own expertise and resources to deal with occupational health problems. The same problems have also existed for management where responses have varied in overcoming them.

In relation to screen-based equipment even getting information and advice has not been easy. There has not been sufficient information or at least readily accessible information on even major problems. More research is being done, more information is emerging and the assistance of occupational health practitioners has increased but a great deal more needs to be done. All the indications are that a serious shortage of occupational health practitioners is likely to continue and will be a major stumbling block to the extension of occupational health services generally.

One of the common responses to technological change in the office has been the production of policies in the form of guidelines on screen-based equipment and its use. Some of these guidelines were developed by unions, others by bodies such as the Commonwealth Department of Science and Technology (VDUs at Work) and others in consultation between unions and management. Most of the guidelines deal with practical aspects of the office work environment which have not received very much attention in the past, such as workplace standards in lighting, glare, noise and temperature, workstation and furniture requirements of adjustable chairs, desks, document holders and footrests and equipment design. Most of them also include policies on eye testing and on rest breaks.

It is obvious reading the various guidelines that a lot of material is common to them, the same phrases recur and so on. I was involved in 1980/81 in a Working Party in Tasmania which drew up "Guidelines on VDU's and Their Installation" which were accepted as policy for all State Government agencies. Like many guidelines ours drew heavily on the information in the VDT Manual (Cakir et al, 1980)[3] which became the "Bible" on VDT's.

The ACTU VTHC Health and Safety Bulletin on screen-based equipment[4] describes the VDT Manual as the best introduction to the whole subject but goes on to say: "The strength of the Manual lies in its technical presentation of VDT's and VDT workplaces - but it shies away from making

recommendations on some of the social issues like mixing tasks and taking work breaks."5

Many unions may have been influenced by the VDT Manual checklists to limit the range of issues they included in their own guidelines dsspite the fact that the Manual includes valuable information on broader issues such as job satisfaction, job organisation and design, fatigue and monotony and alienation.

The ACTU-VTHC "Guidelines for working with Screen-based Equipment" also provided a valuable addition to the information available particularly to unions. It is stated that the guidelines were "produced in response to numerous requests from unions already grappling with problems of working with SBE, or engaged in negotiations over the introduction of new technology".6 Included is material usually not contained in individual union publications such as a description of the technology, an over view of the use of SBE, descriptions of health effects, case studies of union action on SBE, regulations, standards and management guidelines, a trade union strategy and checklist for VDU work and recommended ACTU-VTHC health and safety policy on SBE.

Health and Safety Bulletin No. 26, May 1983 sets out the ACTU Health and Safety Policy on Screen-based equipment adopted in December 1982 by the executive of the ACTU. Broader job structure issues are not dealt with in the policy. The ACTU-VTHC Unit is continuing to monitor and research the issue which is extremely important particularly to asist unions with limited resources and expertise in this area.

The importance of broader issues including job design and work practices and organisation are receiving increasing, if limited, mention in the literature on SBE (as in the Commonwealth publication VDUs at Work), in union policies and in industrial disputes.

For example the Australian Public Service Association (APSA) policy on SBE in April 1980 made virtually no mention of job design. However the APSA has since released a more comprehensive policy as a result of further work and experience in dealing with the issue.

The Federated Clerks Union is one of the biggest unions covering keyboard and other clerical workers. The FCU guidelines titled "Screen Tests for Key People" focus solely on VDU workplaces and do not include anything on job design and work organisation. It is stated in the Preface however that the contents must not be regarded as definitive of the union's thinking on the matter and that the union is keeping abreast of research going on all over the world and is continually updating its thinking in the light of any proven findings.

The reference to job design and work organisation in publications like the union guidelines are still very limited. For example, the APSA policy document "A Safe and Healthy Job?"7 includes a section on Job Task(s) divided into sub-sections on rate of work monitoring systems, work routine, job design and training. The emphasis is on the design of individual jobs rather than broader structures and work patterns. There is no mention of work patterns throughout the working lives of such workers and broader social factors. This is not to say that the unions concerned have not considered these matters but they do not figure in the policies which are generally used as the basis of negotiation with management and as information to members.

The issue of work practices involving more limited design matters was central to the 2 year long dispute involving APSA and FCU data processing operator members in the Commonwealth Tax Office. Negotiation and private conferences between the parties (the unions APSA and FCU, the Public Service Board and the Australian Tax Office) brought agreement on a number of matters but significant areas of disagreement that were not resolved and were brought back to the acting Arbitrator, Mr Booth for decision involved the method by which work was allocated, the recording of individuals" key stroke rates by the computer and questions related to rest breaks.

The areas of agreement which were reached[8] were aspects of training for Data Processing Operators and Supervisors, redeployment policy, ergonomics (e.g. adjustable tables, chairs, etc.), job rotation, keying time, proficiency allowance, maximum and minimum rates, some aspects of rest breaks and shiftwork.

The case involved 60 hearing days, workplace inspections in Melbourne, Sydney and Adelaide, the examination of 21 witnesses, the presentation of 100 exhibits with a wealth of documentary material dealing with overseas research into repetition strain injuries and in excess of 3,500 pages of transcript.

The case, among other things demonstrated the potential for both extensive negotiations and serious industrial disputation in the office area and over occupational health and safety matters.

As well as the area of industrial disputation, common law negligence actions for repetition injury pursued by unions on behalf of their members are becoming more and more widespread.

Such actions, some of which have resulted in significant damages being paid to the victims, have heightened management awareness of the problem and may well contribute to increased efforts by management to prevent repetition strain injury. It could also of course lead to the development of devious means of avoiding workers' compensation and other payouts and this aspect will need to be monitored very carefully by occupational health authorities and unions.

Technological change has provided both impetus and urgency to union demands for consultation and the right of workers to be involved in decisions affecting their working lives. The way in which technology is introduced and the detailed nature of the technology are crucial for their effect on workers. The ACTU-VTHC Guidelines referred to earlier state: "The ACTU decrees that: 'Unions should seek to challenge traditional managerial attitudes and prerogatives regarding consultation, notice and the right of terminations by seeking through award

prescription or by agreement, obligations on employers to consult and negotiate from the contemplative stages on the various issues arising from technological change.'"[9]

Consultation agreements exist in some areas, in relation to keyboard workers notably in at least in several Government employment areas, the Commonwealth, Victorian and Tasmanian public sectors. The TPSA has reasonably effective consultation arrangements through a consultation agreement and through membership on joint union-management bodies such as the State Manpower and Technological Change Committee and the Working Party on Ergonomics of Computer Terminals.

From the available information it would appear this is comparatively rare. Our involvement, however, is not protected in any way as a right to participate. There would seem to be very few examples in Australia of such a right and even of effective two-way consultation arrangements which exist as agreements. Worker participation, in its broadest sense, seems to be notably absent.

The report Technological Change and Employment from the Australian Science and Technology Council (ASTEC) to the Prime Minister in June 1983 provides an overview of consultation on new technology and on worker participation in job design. In relation to the latter it states: "The point to be stressed is that alternative modes of work organisation exist for the introduction of new technologies. The process by which a particular mode is adopted and how it affects the design of jobs and the organisation can be contributed to significantly by employees. For historical reasons such contributions are often achieved only through disputes and pressure in a bargaining framework."[10]

The report goes on to say that: "In the pursuit of effective participation in systems design, a number of well tried approaches have been developed, usually involving a process called 'socio-technical systems design'". And further: "In the particpative

approach the technical system is not considered in isolation, but together with social factors. The approach gives attention to needs associated with personality, such as the extent to which work uses knowledge and skills and allows their further development; to psychological factors, such as the extent to which employees receive recognition, appropriate consultation, responsibility, advancement and security; and to needs associated with successful performance, inlcuding acceptable and effective control systems, a degree of autonomy, and clearly identified tasks of a reasonable scale in the completion of which the employee can take pride(93). In both the secondary and tertiary sectors (17) there are indications that changes such as job rotation and creation of a pleasant physical environment may not produce long-term improvements in motivation if the controls and rewards are the same."11

It concludes: "The studies presented in this Section indicate that significant contributions to minimising the adverse effects of technological change on the nature of work can be made by participation of employee groups in job design."12

One of the examples outlined in the Section is that of Telecom and the dispute over new switching technology. The report states: "An Australian example, which was accompanied by a major dispute, underlines both the conflict of perspectives (between employees and employers) and also the potential for different solutions."13 In brief, the dispute led to a trial of two different arrangements using six criteria as a basis for evaluation: efficiency of operation, standard of service achieved job satisfaction, career opportunities, maintenance of technical standards and retention of expertise and the public interest.

It is interesting to compare this list with the areas of negotiation in the Tax Office DPO;s dispute mention earlier.

The Commonwealth Government has initiated a cost subsidisation program to accelerate more widespread application of employee participation/industrial democracy in Australia. Included in a list of examples of suitable projects is "the establishment of

joint employer/employee working parties on specific issues, such as technological developments or occupational health and safety". The TPSA has applied for funding for a project with the aim of improving the participation of women in matters affecting their jobs and in the Association itself, through development of proposals for job and organisation redesign for keyboard and records areas employees. We have not yet been advised of the success or otherwise of our application.

Keyboard Work

"Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by the working conditions; the protection of workers in their employment from risks resulting from factors adverse to health."14

In this section I explore what are some of the other factors in relation to keyboard work and keyboard workers which are likely to work against this overall aim of occupational health being achieved and which are likely to seriously hinder the achievement of the even more modest aim, the prevention of obvious health problems like repetition strain injury, unless they are taken into account and affect the action taken on these matters.

Two major factors are, first of all high unemployment, particularly women's unemployment and the effect of technological developments in decreasing job opportunities in the office. Keyboard workers are almost exclusively female and keyboard work along with clerical work generally is a very significant employment area for women. According to ABS figures for May 1982 a third of women in the workforce are employed in the clerical field.

Keyboard workers then are very reluctant to "rock the boat" when they know there are thousands of others "out there" who could replace them.

Statistics and commentaries abound on the effects on job levels of new office technology. Whatever the actual figures, the message "New technology equals fewer jobs" is predominantly the one that creates the perception among keyboard workers that their jobs are at risk. Once again this is a powerful deterrent to speaking out and taking action on poor working conditions. For instance one of the very important aspects of treatment of repetition strain injury is early reporting of symptoms so that remedial action can be taken. Fear of losing one's job is a very serious inhibitor to this very necessary early reporting.

Even if one's only source of information is the popular media it is obvious that workers with such injuries are being sacked. Although there is no way of proving how many, from my conversations with office workers including those with serious tenosynovitis I believe that many of them make a conscious and rational decision not to take action on early warning symptoms and other matters because they fear loss of employment.

Their sense of powerlessness as set out by Ros Byrne may well be a part of it but a realistic assessment of the world, whether conscious or not, is also there for many of these workers, and influences the decisions they make. This relates not only to the chance that they will lose their jobs, but also to their chances of getting a wider variety of tasks or being satisfactorily redeployed.

Married women have the additional stress of the attacks on them for "taking others' jobs". For those who feel guilty or doubt the validity of their claim to a job, asking for even more is very difficult even if it is important for their health.

Although there are varied forms of keyboard work and many different working situations, it is possible to describe a number of common patterns. The patterns are reflected in the jobs themselves, in the nature of the work, the

job structures and the workplace organisation. The patterns are those of narrowness and limitation, little control by the workers themselves but control by others, and lack of mobility. Technological change has in some cases simply followed these patterns, in other ways or reinforced or accentuated them.

Many keyboard jobs are marked by a fairly narrow range of tasks particularly at the base grade levels. Many of the tasks are monotonous and repetitive particularly in work on new technology. The narrowness and limited nature of the jobs also has its parallel in limited advancement opportunities, limited scope to learn new skills and to demonstrate skills and abilities, limited options to move into new fields and very limited pay. It is also reflected in the limitations put on what is acceptable behaviour, dress and so on of such workers.

However, keyboard workers all have skills which are largely denied, certainly when it comes to pay and status rewards for them. Many of them have very significant skills. Some will require upgraded and different skills as a result of technological and associated organisational developments for which their limited training base has ill-prepared them.

Many more, however, have had and will continue to experience deskilling, that is, even narrorwer jobs and greater limitations on them. The lack of acknowledgement of their present skills deflects attention from the seriousness of this.

Issues of control are closely linked with those of narrow and limited tasks and opportunities. Keyboard workers generally have little control over their workload and workflows. Their work is often not regarded as integral to a whole process but more as a rather irritating delay between the "real work" and the end result, any credit for which is attributed to the author. Pressure is put on them by processes, procedures and schedules in which they usually have little say.

The control aspect of new technology is manifested very obviously in the monitoring of key strokes and output and by the capacity for machine systems to dictate the pace of work and limit or remove any control that was there with a manual system.

As stated in a paper prepared for the Microelectronics Training Conference in Canberra in September 1983: "Examples of deskilling following automation are significant in extent, yet it is not so much the equipment that induces such changes as the organisational changes that tend to occur."

Movement towards the electronic office concept has tended to introduce 'white collar production line' office structures. The interconnection that forms the basis of automated offices, with all forms of information processing being based on computer facilities, has been reflected in streamlining of work flows in offices. ... The introduction of the new technology has allowed office managers to rationalise typing services in their organisation, so that the tradition of most typists working direct to an executive or serving one work area has been replaced by a pool organisation.[15]

For "streamlining" and rationalise", read greater control, greater limitations. In some organisations including Public Services, the typing pool has always been a major form of keyboard work organisation. Ironically, attempts to decentralise pool arrangements to provide more varied work have in my experience often been opposed by typists-in-charge attempting to retain the small amount of control they have in their organisations.

Pool arrangements contribute significantly to the limited mobility of keyboard workers. The lack of mobility applies not only to physical movement but also to the lack of alternative work and advancement opportunities. Keyboard workers often have "little room to move" in more ways than one. Union organising and the involvement of such workers in union activity particularly in job representative or shop

steward roles is severely limited by this aspect. Among the adverse effects of SBE are the increased control of mobility and the greater limitation on social interaction which further exacerbates this situation for unions.

These characteristics of keyboard work and the patterns that they form impose great constraints on the practical implementation of many proposals for the creation of better working conditions and in tackling occupational health problems unless they are recognised and accounted for. For example the issue of rest breaks, both their frequency and duration, is a disputed one and it is an issue which demonstrates some of the difficulties and ironies in this area. The Commonwealth Department of Science and Technology publication VDU's at Work states: "The individual is the best judge of when he or she needs a break from the screen, and some flexibility in allowing operators to schedule their own rest pauses will prove more effective than rest pauses at fixed times."[16]

There are a number of problems with this, fine as it may be in theory. One is that in many work areas unless definite and specific rest breaks at specific times are negotiated with the management the workers are unlikely to get them. The pressure put on processing areas to keep to schedules over which they have no control makes it very difficult for them to choose when to take a break. On the other hand, breaks at specific times can have the effect of greater control and regimentation of the workers.

When some flexibility is given the workers will often disregard advice on the necessity of frequent short breaks and choose to overcome the increased limitation on social interaction by combining breaks to take long ones less frequently.

More varied work, jobs where VDU use only makes up part of the worker's job, is virtually universally recommended. Tasking rest breaks from work that is made up substantially of VDU

use is a very poor though necessary alternative option. It may well be the case that disputation over training and the number and frequency of breaks may take up substantial resources to no-one's complete satisfaction in the end.

These aspects were reflected in the Tax Office case mentioned earlier. In his decision on the issue Acting Arbitrator Booth states: "The DPO's themselves have very definite views which, no doubt, were based upon their personal considerations. Some wished to 'bank' their breaks so that they would have a long break at the end of the day whilst there was generally strong opposition at what was seen by them to be attempts by management to over-regulate them. There is no doubt that regular breaks are necessary from keying duties and I am aware that the importance of taking regular breaks for health and safety reasons is one of the matters which will figure prominently in the newly revised DPO training programme."[17] He then declined to grant the union claim for 15 minutes break within each hour of work which had been the subject of considerable "expert" evidence, deciding instead on 10 minutes break after each hour of work.

The indication is that "training" will achieve the desirable result, the DPO's will see the error of their ways and take the breaks when they should. I do not believe there is any guarantee of this at all.

The major points, however, are that there are serious difficulties related to rest breaks and while use of a VDT makes up the substantial proportion of a person's work, that person will be very vulnerable to serious health problems. When the rest break factor is added to all the other conditions which should be satisfied for the VDU workstation, work area and work practices to be satisfactory from an occupational health point of view, and a similar pattern of difficulties occurs with many of them, that worker starts to look very vulnerable indeed.

It is extremely important that the social organisation of the work and the broader issues of work patterns and structures are recognized when action on occupational health problems is being proposed. One of the extremely important roles for unions to play is in making the wider political and industrial connections from the information they receive from occupational health practitioners. Claims for essentially minor changes in the working environment and job design of keyboard workers will in my view, be seen as clearly inadequate when these wider connections are made. It is only then that strategies will be developed to achieve more fundamental changes in the structure of keyboard work.

Equal Employment Opportunity

Making the wider political and social connections is also an important role for equal employment opportunity practitioners to play in relation to keyboard workers, technological change and occupational health.

Occupational gender discrimination is a significant feature of the working lives of female keyboard workers. The development of strategies to eliminate the systemic disadvantage will depend to a large extent on the issue becoming a high priority as an equal employment opportunity issue.

The emphasis to date in those public services which have had equal opportunity units has been largely on increasing the opportunities for such workers to move out of keyboard areas and into other clerical streams with greater advancement opportunities. This has had very limited success for a number of reasons.

In June 1983 the Public Service Board of NSW issued "Guidelines for Effective Use of Keyboard Services" which comments in paragraph 3.4: "Various initiatives to further equal employment opportunity have removed some of the major formal

barriers to greater promotional opportunities and improved job satisfaction of keyboard personnel. Nonetheless there continues to be organisational impediments to their mobility. The most significant is the organisation of work performed by keyboard staff, which frequently restricts the range of duties performed. As a consequence, keyboard staff are not generally able to demonstrate that they have the requisite experience or the "efficiency" to compete for positions outside the keyboard area."[18]

The guidelines go on to make valuable comments and recommendations on the organisation of keyboard work, the disadvantages of typing pools, the effective use of word processing and other screen-based equipment, organisational alternatives to typing pools and means of improving effectiveness of keyboard services. Although the issue is approached from a management point of view, there are considerable benefits for keyboard workers if employing agencies are convinced that there is something in it for them in terms of increased efficiency, effectiveness and productivity if they improve the opportunities and working conditions for keyboard staff.

After four years as Equal Employment Opportunities Officer for Tasmanian State Government Employment and over two years as an Industrial Officer for the public service union, I am convinced that combined equal opportunity programs and industrial initiatives are both necessary and most likely to achieve significant changes. I have noted with great interest recent press reports about a draft equal pay implementation manual prepared by the ACTU Working Women's Centre and distributed to all ACTU affiliates. At the time of writing this I have not seen the manual but view with great interest quotes continued in the press reports. I quote from the Financial Review article of 19th April 1984: "The paper says that rigid 'gender segmentation of the workforce' is largely responsible for the remaining sexual pay discrepancies ... It suggests a counter strategy of a possible ACTU submission to next year's review of the

Arbitration Commission's pay guidelines seeks a re-evaluation of traditional female jobs based on the concepts of 'comparable worth'"[19]

And further: "Examples of occupational gender discrimination include the clerical area, in which female workers tend to be confined, while males are often formally or informally trained to move to occupations designated as administrative, executive and clerical. Therefore we have women in jobs in which they will stay for the duration of their employment, compared with males who are in transition to a higher earning bracket' the draft manual says: 'Typists receive a low wage and yet typing is a highly skilled occupation. The most outstanding feature of this occupation is that it is performed almost entirely by women and it would seem that this alone is the reason for its low average rate of pay.'"[20]

All these aspects are relevant to restructuring the workplace for keyboard workers. Management equal opportunity programs are extremely important but the industrial ramifications and opportunities have been largely untapped.

An important example of industrial change is the South Australian combined clerical award for keyboard and other clerical workers in the Public Service. Award changes of this kind, taking keyboard workers out of their narrow and limited awards and placing them in a general clerical award can help to break down barriers to move to varied jobs and wider opportunities. There are still problems in South Australia with the assessment and proper classification of some keyboard work and other traditional female jobs but the award is a step in the right direction.

Concepts and Strategies

Some of the basic concepts and ideas which could help to form the strategies to improve the working lives of keyboard workers have been indicated already. They include the basic idea that technological change and occupational health issues create both the need for, and the opportunity for,

significant change to the structure of keyboard work. The opportunity exists for changes to traditional organisational and administrative structures particularly at the time of the introduction of new technology. This process should best be achieved with the informed involvement of all participants - the workers themselves, their representatives, the unions, occupational health and equal opportunity practitioners as well as management.

The involvement of the workers in any changes to their jobs and work structures is crucial. There is a need for unions to encourage their increased involvement in union activities in order to build the effective industrial campaigns that will be necessary if significant change is to be achieved. A range of strategies will be necessary based on a detailed analysis of the barriers to women's involvement. These will vary from union to union and from workplace to workplace.

For those not covered by unions or whose unions will not act on their behalf the strategies need to be different. Ros Byrne suggests at the conclusion of her paper a network aimed at empowering women office workers or furthering research in this area. The need may also be there for a national body like the US "Nine to Five" organisation. A national network could perhaps create the momentum for such an organisation.

Different strategies in the workplace for achieving structural changes will be necessary for different groups of keyboard workers and for experienced workers compared to new workers. The notion of restructuring the workplace for keyboard workers has significant implications for schooling, further educational and training of such workers. Concepts of multi-skilling and recurrent education are relevant.

For new workers, preventing their retrenchment in narrow jobs with limited opportunities is an important objective. Professor Bill Ford, in an unpublished paper based on a

speech delivered to a Women and Technological Change Conference suggests the need for new apprenticeships. He states: "Unlike Germany, Austria and Switzerland, apprenticeships in English speaking countries is basically confined to traditional trades. There is an urgent need to develop systematic training programmes for people entering the information sector..... Young girls are being locked into narrow machine operating positions with limited future learning opportunity or career options."[21]

He goes on to list the objectives of an information or administrative technology apprenticeships as:

1 to provide a broad based skilling in the operation and maintenance of a range of office technologies;
2 to break down sex stereotyping in relation to information technologies;
3 to multi-skill people to enable them to exercise occupational, organisational and career choice;
4 to develop a sound base for recurrent learning;
5 to reduce the stress of technological change; and,
6 to reduce the possibility of people being locked into monotonous and dangerous jobs.

Above all there is the need for multi-disciplinary, multi-faceted, creative and innovative approaches to the serious issues confronting keyboard workers. The potential exists for he restructuring the workplace for them but only with concerted and committed efforts by all those involved based on a critical, broad analysis of their work and working lives.

References

1. Quoted in W.B.Creighton and E.J. Micalley "Occupational Health and Safety as an Industrial Relations Issue: The Rank-General Electric Dispute 1981" in the Journal of Industrial Relations Vol. 25, No. 3, September 1983, p.257.

2. Commonwealth Department of Science and Technology, VDU's at Work Occupational Health and Safety. Working Environment Series No. 13, 1981. See particularly pp.26-27.

3. A Cakir, D.J. Hart and T.F.M. Stewart Visual Display Terminals: a manual covering ergonomics, workplace design, health and safety and task organisation, Wiley, 1980.

4. ACTU - VTHC (Victorian Trades Hall Council) Health and Safety Bulletin "Guidelines for Working with Screen-based Equipment", No. 12, May 1983.

5. Ibid, p.42.

6. Ibid, p.44.

7. APSA. A Safe and Healthy Job?: APSA policy for safe and healthy keyboard and screen environments, April 1983.

8. Determination No. 327 of 1983, Conciliation and Arbitration Commission sets out details of the case.

9. ACTU - VTHC, Op. cit., p.28.

10. Technological Change and Employment, a report to the Prime Minister by the Australian Science and Technology Council (ASTEC) prepared by the Technological Change Committee, Australian Government Publishing Service, Canberra, 1983.

11. Ibid, p.123
Footnote (93) is E. Mumford, 'The Participative Design of Clerical Information Systems - Two Case Studies,' pp.93-94. In N. Bjorn-Anderson, Ed., 'The Human Side of Information Processing', pp.91-105. Amsterdam, North Holland Publishing Co., 1980; 229pp.
Footnote (17) is M. Jacka and A. Game, 'The Whitegoods Industry: The Labour Process and the Sexual Division of Labour'. School of Behavioural Studies, Macquarie University, 1980; 107pp.

12. Ibid, p.123.

13. Ibid, p.121.

14. Quoted in NHMRC "Recommended Practice for Occupational Health Services in Australia", March 1981 from 1950 joint ILO and World Health Organisation Committee.

15. G. Colquhoun "Training Responses to the Impact of Microelectronics - based Office Technology on Office Organisation and Job Content" prepared for Workshop on Microelectronic Training Needs, Canberra, September 1983.

16. VDU's at Work, Op. cit. p.7.

17. Determination No. 327 of 1983, op. cit, p.447.

18. Public Service Board of NSW, "Guidelines for Effective Use of Keyboard Services", June 1983, p.3.

19. Financial Review "Sexual Wage Discrimination Lingers On", 19 April 1984.

20. Ibid.

21. G.W. Ford "Technology, Women and Employment: The Need for New Concepts and Criteria for Policy Formulation" Unpublished paper, 1983.

REPORT ON ONE-DAY SEMINAR PRESENTED BY DR CHARLES WALLACH AT MANAGEMENT HOUSE, MELBOURNE ON MONDAY 2 JULY 1984 ENTITLED "NEW INSIGHTS INTO ENVIRONMENTAL HEALTH AND PRODUCTIVITY"

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Report on one-day Seminar presented by Dr. Charles Wallach at *Management House, Melbourne on Monday July 2nd 1984 entitled* "New Insights into Environmental Health and Human Productivity"

1. INTRODUCTION

This seminar, presented by Peter McKay International and led by Dr. Charles Wallach extended from 9 a.m. to 4 p.m.

Information made available to participants included background comments on Dr. Wallach's career and a statement on the seminar objectives. It was stated that "Dr. Wallach will present a synthesis of his extensive research and the consulting he has carried out around the world". A check list of what participants could expect from the seminar also included the following:

- "A distillation of three decades of international scientific research effort and medical opinion into the issues which involve workers and new technologies in the work place."
- "An analysis of the causes and effects of the very real VDU health hazards" with demonstrations a special feature.
- "The new discipline of aeroelectrostatics - the harmful effects of improper ion balance in the air."

The specific seminar objectives were stated to be:

(a) To provide powerful new insights into how to improve the health, productivity and creativity of employees.

(b) To provide participants with a clear understanding of the real and possible health hazards of VDU's and knowledge of the highly effective counter meaures now available to organizations.

(c) To summarise recent research and documented experience of U.S. organizations into the reduction of lost time in the work place due to sickness and work related illness.

(d) To demonstrate, with actual case studies, how overall quality of life can be enhanced in the work place.

2. MATERIAL SUPPLIED

Apart from a list of the 128 participants notes were provided on the following seven topics:

Atmospheric Ions

Radiation Effects

UV Radiation and Cataracts

Visual Processing

Illumination

Noise

Wishful Thinking

Short statements were also provided on

(i) Some long term effects of physiological stress from VDU's

(ii) Implications of non-linear interactions in biological systems

(iii) Very low frequencies from VDT's

(iv) Very low frequency biological effects

(v) Radio frequency/microwave bioeffects

(vi) RF/MW from VDT's

(vii) Some current research areas - a flow chart issued by the International Bio-Environmental Foundation.

Also included was a leaflet "Tomorrows Technology, To-days Headache" advertising a slide-sound presentation on the hazards of working with Video Display Terminals. This was produced for the New York Committee for Occupational Safety and Health through contributions from various American Communications and media workers' unions as "a concise and provocative tool to spur discussion at union meetings, union education courses, health and safety workshops, conferences and in the classroom".

A list of manufactured products, available commercially as VODS (Video-Display Operators Distress Syndrome) countermeasures from a variety of countries, was also made available during the seminar.

3. STRUCTURE OF THE SEMINAR

The seminar was introduced by an overview of the Video-Display Operators Distress Syndrome (VODS). It then proceeded to categorise the symptoms and deal with specific aspects such as the effects of atmospheric ions, electrostatic fields, radiation, illumination, noise etc. An attempt was made to intrude a demonstration of ion effects into the seminar proceedings. It was intended to dramatise the ability of negative ions to purify a smoke-contaminated atmosphere by precipitating the polluting particles. Although not successful it is well known that dusty T.V. screens arise from such negative ion action. Indeed the removal of dust from the atmosphere in this way is also known to be a possible reason for certain types of asthmatic sufferers gaining relief through the use of ion generators. A variety of such generators, conductive screen filters etc., were available for inspection by the participants.

Much of the information presented can be found in Dr. Wallach's book "The Ion Controversy" which was made available for purchase at the end of the Seminar. It claims to be a scientific appraisal. In general terms, however, neither the material of the book nor the material presented at the seminar could be classified as science. At least not in the sense that statistically significant measurements of specific effects were presented in a form that could be subjected to independent assessment leading to unambiguous conclusions about cause and effect.

The bulk of any possibly significant material was presented in anecdotal form and with only one or two exceptions, mentioned below, no references were provided, with the seminar material, directing attention to pertinent scientific literature. Given this structure to the seminar and the approach adopted by Dr. Wallach, the seminar experience was singularly frustrating for anyone approaching the issues with an open mind and seeking valid evidence to substantiate the anedotal reports.

Fortunately Dr. Wallach set aside a limited period during the day to answer questions. This led to comment on several matters raised by Dr. Wallach, the comments being based on reliable, quantitative measurements. As a contribution towards making an objective assessment of the issues raised by the seminar they emerged as particularly significant and are discussed more fully below.

4. EFFECT OF RADIATION FIELDS

During the second morning session Dr. Wallach referred to his handout no. 3 concerned with the "Implications of Non-linear Interactions in

Biological Systems". This contained specific reference to an article by Eldon A. Byrd of the US Navy (Surface Weapons Center, Whiteoak MD) in the winter 1983 edition of ARCHAEUS (Minneapolis) pp 1-6. The quoted abstract stated:

"Recent work has revealed the ability of low-intensity, non-linear extremely low-frequency (ELF) and low intensity ELF pulse-modulated microwaves to influence various physiological and behavioural processes in cells, tissue, animals and humans". A further quotation from the article itself stated that "it has been repeatedly demonstrated that cells can sense the electromagnetic environment and respond to changes in it of 10^{-7}V/cm" ($\equiv 10^{-5}$V/m).

In this context Dr. Wallach proceeded to show the results of measurements of the electric fields surrounding operators at distances of 30 cm from the VDU screen. He stated these to be 55 V/m and that because of the flyback source generating r.f. fields, situated at the rear of the VDU's, this level of 55 V/m could also be meaured at some locations 100 cm from the screen.

This prompted some direct questioning from Graeme Elliot, Science Officer at the Australian Radiation Laboratories where an extensive investigation had been undertaken on the "Measurement of Electromagnetic Radiation Emitted from Visual Display Terminals" (ARL/TR053 March 1983). The ARL measurements found these levels to be incorrect. The report itself shows levels ~ 10^{-1} - 10^{-2} V/m at 30 cm for all but one of the units tested and in that particular instrument the maximum observed was 2.7 V/m.

5. EFFECT OF RADIATION (microwave, r.f., infra-red, visible, U.V., X-rays)

Dr. Wallach also referred to effects associated with both ionizing and other non-ionizing forms of radiation. His handout no. 3 quoted from the article by Eldon A. Byrd

"Behavioural modification in animals as the result of weak (as low as 10 microwatts/cm^2) microwaves ... include induction of grooming responses, altered heart and respiration rates, epileptiform seizures, and various others. The lower the power, the more immediate the effect..."

He also referred specifically to the incidence of cataracts resulting from exposure to UV-radiation.

Again the matter of levels of radiation has been extensively investigated by ARL and Graeme Elliot provided some quantitative information. With a limit of detection as low as 0.01 to 0.05 milliroentgen per hour (Standards Association of Australia recommend that exposure rates should not exceed 0.5 mR/hour) measurements of ionizing radiation from VDU's were made. No single VDU was shown to emit X-radiation. Measurements of non-ionizing radiation showed that visible and infra-red emission levels measured at 10 cm from the screen were many orders of magnitude below maximum permissible exposure levels defined by the Standards Association (< 0.1 mW/cm^2.sr compared with Standards requirements of < 10 mW/cm^2.sr. ACGIH, 1981). At the normal operating position of 30 cm or more the levels would be considerably less. The maximum radiation level for UV was found to be 2 x 10^{-4} mW/cm^2 at 10 cm from the screen (compared with 1 mW/cm^2 for continuous exposure set by Standards ACGIH, 1981).

None of the terminals tested by ARL had any detectable level of microwave emission.

Dr. Wallach's reference to the problem of UV-induced cataracts leading possibly to a higher incidence among VDU operators prompted some further questioning of Dr. Wallach's evidence. The comment was made that the maximum UV irradiance measured from a VDT by ARL was 250 nanowatts/cm^2 which was some four orders of magnitude less than the 2.7 milliwatts/cm^2 received by exposure to sunlight. A further comment by one of the participants that he was not aware of any scientific literature about the incidence of cataract occurring at an earlier age in VDU operators, then prompted Dr. Wallach to confirm that neither was he and that it was all supposition at this stage. The questioner then referred to possible scare among VDU operators and thought it mischievous to raise these issues if not substantiated. Since, as the ARL measurements showed, a 40 W fluorescent light unit produces a UV irradiance of 1.9 microwatts/cm^2 at 1.4 m compared with 250 nanowatts/cm^2 for the VDT unit, some questioning of the claims of a relation between fluorescent lighting and skin cancer also emerged. At this stage it was pointed out by a participant that the skin cancers had occurred on parts of the body not exposed to the fluorescent irradiation. When pressed on the matter Dr. Wallach confirmed that there was no evidence, but an increasing number of anecdotal reports and an increasing awareness by opticians and others. Further ARL comment referred to an authoritative report from the National Research Council of the US Academy of Sciences in 1983. On the question of cataracts the report refers to 2 out of 10 patients reporting cataracts which were in fact "inconsequential opacities" and concluded that it "probably does not represent a threat". There the matter rested.

Apart from these specific matters, the seminar fell far short of, meeting the expectations and achieving the objectives set out in the introduction above. Dr. Wallach stated his own position at various times during the seminar. He claimed to have no emotional position in the issues, he simply wanted to help and leave the participants to make their own judgements. He at one stage admitted that an anecdotal report of a 43 year old professor suffering an asthma attack after watching a TV screen in Denmark had no signifance. On the matter of the radiation fields and the close questioning and comment from the ARL scientists, his response essentially was to question the international standards in this area. He appeared to be arguing, on the basis of Eldon A. Byrds quoted comment that "The lower the power, the more immediate the effect ---", that a new theory and a new area had not yet been investigated. Following these statements, he provided further anecdotal stories about a variety of matters including the egg-laying capacity of hens, psychotic effects under investigation in California etc. and concluded by commenting that he was "not here to scare people" but to point out that we have simple precautions available. He switched at this point to report some findings of a Canadian Survey in September 1983 on Work and Pregnancy, stating that 22% of VDU operators in the survey had spontaneous abortions. This he stated was greater than twice the percentge for the normal population.

This survey has not yet been published but I understand some 14735 cases were examined, surveying the occupations followed by women in the workforce to check possible correlations between specific occupations and pregnancy abnomalities. For this purpose the workforce was categorised into some 14 groups, the average figure for all groups being 19%. Those groups involved in assembly line activities, piece work, shift work, heavy

lifting and the like, average 20-24%. Dr. Wallach's figure of 22% for VDU operators must be assessed therefore in the light of all this informtion. The correlation with other groups would suggest that it is job content itself rather than VDU's in particular that should be treated as the relevant parameter.

The afternoon sessions were prefaced by Dr. Wallach's comments on the need for a prudent approach to the issues raised. He referred to the need for more scientific data and to the time required to accumulate it. He argued that it was prudent to take precautionary measures and, given the links to productivity, (these were never convincingly established at any stage in the Seminar) he believed society would not lose on the investment. At this point he referred to questions that had been raised elsewhere about his personal financial involvement in the companies marketing the various devices on display and stated that he had no shares in any of the companies. There followed a survey of the ion generators available, their costs, suppliers etc. and an invitation to inspect them.

6. SUMMARY AND CONCLUSIONS

For the scientist the Seminar had little, if any, significance. It failed to provide any reliable evidence to support a view that VDU operators are subjected to health hazards based on imbalances in the concentrations of positive and negative ions in the atmosphere caused by the operation of the VDU devices themselves.

On the other hand the wealth of anecdotal material served the purpose of creating concern on some aspects and leaving an impression that the Scientists have some long way to go before being able to deny

categorically, on the basis of statistically significant scientific evidence, that no such hazards exist. Despite the refutation of claims made about the effects of radiation fields and of ionizing and non-ionizing radiation by ARL scientists, brief conversations with several participants after the seminar confirmed that concern about such matters had not in fact been dispelled. Until the vast amount of anecdotal information is balanced by more high-quality, soundly-based scientific data these impressions will undoubtedly persist in the workforce.

It would have been far more helpful had Dr. Wallach met, as a group, the relatively small number of scientists in Australia who have been investigating various medical and other aspects of potential VDU hazards in order to separate fact from fiction, reality from speculation. In this area, above all others, prejudices, business interests and the like need to be removed from the research scene if we are to converge towards an honest assessment of the health risks. The Melbourne seminar could not and did not establish confidence in the integrity of much of the anecdotal material presented which could not, therefore, be subjected to objective scientific scrutiny.

7. SOME POST-SEMINAR COMMENTS

Given the unsatisfactory outcome of the Melbourne Seminar opportunity was taken to discuss some of the issues with other Australian scientists who have given serious consideration to these matters. The following are some brief comments about the salient points that emerged:

(i) The Nature and Identity of the Atmospheric Ions

In a paper entitled "The Nature and Identity of Ions in the

Earth's Atmosphere at the Earth's Surface", Dr. M.T. Elford of the Electron and Ion Diffusion Unit at the Research School of Physical Sciences, A.N.U. summarises the present status of knowledge and states that at sea level the positive ions will consist of proton $(H^+(H_2O)_n)$ and non-proton $(H^+x_n(H_2O)_y)$ hydrates whilst the negative ions will consist of cluster ions with acid molecules e.g. $NO_3^-(HNO_3)_2$, $HSO_4^-(H_2SO_4)_3$ etc. following the formation of the "sink ion" $NO_3^-(H_2O)$. The more obvious negative ion species such as O^-, O_2^-, NO_3^- and O_4^- do not appear.

At the Seminar Dr. Wallach did not devote any time to considering the nature of the negatively or positively charged ions. He made reference to the negative ions being O_2^- ions and his book (p.13) states that

> "We are concerned here chiefly with five gaseous molecules, CO_2^+, H_2^+, H_2O^+, O_2^-, OH^-. These are technically classed as small atmospheric ions or "air ions"; there are other types of ions in the air as well, but these are the ones which mainly appear capable of affecting our metabolic processes by generating a single-electron current through the skin or membrane on contact, and thus causing other molecular interactions (often far more complex ones) in the deeper tissues of the body"

Clearly any arguments based on Dr. Wallach's ionic species are suspect, if not totally erroneous, since atmospheric ions apparently do not exist in these simple forms. A recognition of these facts is essential and this recent research on ion identity should set the stage for future efforts to evaluate whether atmospheric ions constitute health hazards in the use of VDU's. Whilst the nature of the particular ions would not significantly

affect any arguments based on the electrical properties of the atmospheric ions the chemical properties of the ionic species present may have very different and more significant influences. This has not been researched in any detail and it seems to me to be an area that needs much more scientific investigation before being dismissed as of no importance.

(ii) Visual Effects involving Eye/Brain Interactions

From brief discussions with medical scientists in Canberra I understand that medical evidence supports the view that some 10% of the population show special sensitivity to visual effects. This distinct photosensitivity, leading to eye/brain interactions is not uncommon. During the Melbourne seminar this did not emerge as a topic given any special emphasis although it seems to me to be an area needing further scientific data. It needs to be established for example, whether flicker phenomena in general, associated with VDU operations can have adverse effects on persons known to be photo-sensitive.

(iii) Effect of Ions on Asthma Patients

Some Australian studies have been carried out at the Australian National University into the effect of ions on asthma patients by Dr. Alan Mortlock and his students. They represent a significant contribution to an enormously complex problem. Their investigations were well-planned, thoughtful and carefully executed and deserve to be given far more attention and considertion than the vast majority of anecdotal information provided at the seminar. It was clear in conversations with Dr. Mortlock that he believes that his limited investigations have demonstrated a need for a more extensive research effort. It cannot be claimed that he established overwhelming evidence that ion generators had beneficial effect on the group of patients involved. Neither do the results so far justify

ignoring the issue altogether at this stage. In my judgement these investigations command more respect than any investigations that have come to my attention in the information provided by Dr. Wallach.

S C Haydon

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EYESIGHT TESTING OVERSEAS

COPY

TELEGRAM

3 May 1984

To: BONN/STOCKHOLM/WASHINGTON/LONDON/WELLINGTON/OTTAWA
Fr: CANBERRA

Eyesight testing for VDU Operators

From File 83/7972

For Trade from Health

Could you seek the following information from health authorities:

1) What eyesight tests (if any) are carried out on Government employees operating visual display units?

2) Are these tests performed by nurse, specialist, general practitioner or other specialist staff?

3) Are tests performed regularly or only for pre-employment screening?

4) What criteria is used for assessing results?

COPY

INWARD CABLEGRAM

9 May 1984

To: CANBERRA
Fr: OTTAWA

Eyesight Testing for V.D.U Operators

To File 83/7972 From File 266/2/11

For Health

Your Telegram addressed quote for Trade from Health unquote refers

Canadian Federal Health Authorities advise that no special eyesight tests are carried out for Federal Public Service V.D.U. operators. They receive the same eyesight tests as other Canadian Federal Public Servants.

2. In a recently concluded contract won by provincial public servants provision is made for special tests for VDU operators employed by the provincial government. We expect to have details shortly and will advise you further.

COPY

INWARD CABLEGRAM

14 May 1984

To: CANBERRA
Fr: WASHINGTON

Eyesight Tensions for VDU operators

To File 83/7972

For Health

According to Nancy Kingsberry, staffing office of Office of Personnel Management there are no eyesight tests carried out at any time on U.S. government employees operating visual display units.

2. OPM is not aware of any scientific data at this time that would provide evidence for greater eyesight requirements than in a normal typing environment.

3. The Rehabilitation Act would make preliminary eyetests very difficult to implement becuase it would have to impose a cutoff point on the basis of a handicap. The Rehabilitation Act prohibits discrimination on the basis of handicap.

4. If, in the future, it is scientifically established that VDU use results in greater eye strain, testing may be introduced but it would be only for eye maintenance and not for the purpose of selection.

COPY

OUTWARD TELEGRAM

15 May 1984

To: CANBERRA
Fr: WELLINGTON

Eyesight testing for VDU Operators

To File 83/7972 from File 208.5.4

For Health/From Trade

Have discussed details with NZ Health Department and the NZ States Services Commission.

2. Dr Stokes, Director Occupational Health Division of NZ Health Department advises

A. He is invited observer to the Australian Health Department NHMRC Occupational Health (Standing) Committee (Secy Jan Tink) which is concerned with this particular topic.

B. The NZ Health Department makes recommendations on the design of the workplace with special emphasis on the worker/machine interface. They have concluded that there is no necessity for regular eyesight testing. However they have made suggestions as to frequency i.e. increasing frequency with increasing age, for those who show special concern.

C. The State Services Commission and the Public Service Association (Union) have negotiated an arrangement on this subject but without consultation with Health. Stokes is unaware of the terms of arrangement.

3. The State Services Commission advise that there is an administrative agreement with the P.S.A. (not part of the award) which is currently under review and renegotiation. The main points are:

A. Tests are only carried out on staff using VDU's more than 50 percent of their time and that were employed prior to the introduction of the equipment into that work. These are not (underline one) carried out as a matter of routine.

B. Testing is carried out by people with qualifications in the area of eyesight testing ie optometrists, opthalmologists etc.

C. If a worker can provide evidence of a change of eyesight because of use of VDU then there is a level of reimbursement of testing costs etc.

D. Tests are not (underline one) performed regularly nor (underline one) as pre-employment screening.

E. Criteria for assessment are those normally used by the professionals conducting the tests.

5. The State Services is sending us a copy of the agreement which will be forwarded to nominated address (please advise) when received.

COPY

INWARD CABLEGRAM

16 May 1984

To: CANBERRA
Fr: STOCKHOLM

Eyesight Testing for VDU Operators

From File 120/1/1

From Trade for Health

In Sweden the National Board of Occupational Safety and Health is responsible for questions regarding eyesight tests on employees operating visual display units.

The person in charge who can provide answers to your questions is unavailable until 23/5. We will revert.

COPY

INWARD CABLEGRAM

22 May 1984

To: CANBERRA
Fr: LONDON

Eyesight Testing for VDU Operators

For Health from Trade

The Civil Service Medical Advisory Service has provided the following information concerning the tests provided for UK government employees using VDU's.

Begins

Since 1980 a voluntary eyesight screening test has been offered to all who are asked to use a VDU in the normal course of their duties. This test is carried out by an occupation nurse or physician. Where the operators are isolated then they are invited to attend a local optician for the test. Opticians use whatever test they think appropriate, but are guided by instructions given by the association of optical practitioners. The Medical Advisory Service uses the keystone telebinocular vision screener. In fact, this machine can readily be used by a first aider or other lay person.

Our experience over 8 years has shown there is no indication for initial screening and certainly no indication for regular routine screening. My belief is that where there is a problem the operator is likely to be aware of it and advice can be sought from us on an individual basis.

There is no routine pre-employment examination within the Civil Service.

If an occupational nurse is conducting the testing on site then she assesses the results. We have found that special glasses are needed in about one in every 200 VDU operators (usually these are in people over 50 who have separate reading and distance glasses or bifocul lenses). If special glasses are thought to be necessary for seeing the VDU screen clearly, my advice is that the cost of these should only be authorised by a doctor in the medical advisory service. Almost always the cost is less than Pnds Stg 30.00 though on occasions I have seen opticians bills totalling over Pnds Stg 200.00: these are not accepted as a charge on the exchequer.

In our experience, it is very rare for any medical condition to preclude using a VDU at all. Where this has been necessary it has not depended on the result of the eyesight screening test - for various reasons the operator is aware of a possible medical cause why he should not use a VDU.
ENDS

COPY

INWARD CABLEGRAM

28 May 1984

To: CANBERRA
Fr: STOCKHOLM

Eyesight Testing for VDU Operators

From File 120/1/1

From Trade for Health

Further to O.ST14874 the Board of Occupational Safety and Health advises that at the moment eyesight tests are not carried out on a regular basis among government employees operating visual display units.

The Board is involved in a research project which is expected to be finalized in March 1986 and which will be decisive for future regulations.

1. The following tests which are divided into two main groups, are used as basis in connection with the research project. However, the eventual procedures will be more simple:

I.
- Refractioning
- Visual Acuity
- Measurement of corneal radius (with javal instruments)
- Examination of anterior segment
- Examination of the eye's medias
- Examination of ocular fundus
- Control of the intraocular pressure

II.
- Refractioning
- Orthoptic examination
- Examination of the motor status and movements with prism and cover test
- Examination and assessment of the near point of convergency
- Examination and assessment of the near point of accommodation
- Examination of colour vision
- Examination of stereopsis (applies to land-surveyors and microscope operators)
- Examination of scotopic vision (applies to policemen and customs staff)

- Examination of night myopia (also applies to policemen and customs staff)
- Visual ergonomy examination (studies of work methods and work routines
- Measuring of reading distances and directions, documentation of work progress)
- Examination of industrial hygiene (measuring of static electricity, light air ions and ultra violet radiation)
- Thermic measuring of comfort (speed of the air-flow, air-temperature, medium radiation temperature, humidity, measuring of dust)
- Evaluation of subjective complaints (through standardized interview forms)

2. The tests are presently performed by opthalmologists, orthoptists, lighting engineers and visual ergonomists.

It is recommended that in future they will be performed by company health services and opticians.

3. Today eyesight tests are only performed on an ad hoc basis.

It is recommended that in future eyesight tests should be carried out pre-employment, at the age of 40 and thereafter each 5th year, as well as when employee complaints of eye problems.

4. There are presently no criteria used for assessing results.

COPY

INWARD CABLEGRAM

14 June 1984

To: CANBERRA
Fr: BONN

Eyesight Testing for VDU Operators

Answers for West Germany as follows

1. Eyesight tests are carried out on VDU operators in FRG Public Service. This was determined by a circular instruction issued on 27 August 1981 to all government departments.

2. These tests are performed by staff medical practitioners, who are usually specialists in occupational medicine. There is eye testing equipment available in each administrative area (Rodenstock R 8).

3. Tests are performed prior to appointment and thereafter at five-yearly intervals: after the age of 45 at three-yearly intervals.

4. The criteria on which the tests are based are laid down in the guidelines issued by the Association of Industrial Injuries Insurance Institutes, the body in the FRG responsible for administering the occupational accident insurance scheme.

2. We have the documents referred to in 1 and 4 above but they are in German and we cannot allocate resources for their translation. If Department of Health wishes, we can send German texts. Alternatively we can have them translated commercially, for which we will need approx DM3,000.

SELECTED BIBLIOGRAPHY

Australia

1. "Comments on Low Level Radiation Exposure", BELL, J S, B.E. (ELEC), M.E., C.Eng., M.I.E.E., M.I.E. Aust., The Medical Journal of Australia, August 21, 1982.

2. "Vision and the Video Display Unit. A Review", CHAKMAN, J and GUEST, D J, Australian Optometrical Association, Australian Journal of Opthalmology (1983); 66, (4): 125-137.

3. "Pause Gymnastics", Exercises compiled by Barbara McPhee, Commonwealth Institute of Health, The University of Sydney.

Canada

4. "Health Effects of Visual Display Terminals: A Report of the Health Advisory Unit", ELINSON, L; ROSENBAUM, L; HANCOCK, T; CAPLAN, G., City of Toronto Department of Public Health, Toronto, Canada; July 29, 1980.

Great Britain

5. "Human Factors Aspects of Visual Display Unit Operation", MACKAY, C, Senior Psychologist, Employment Medical Advisory Service, Health and Safety Executive Research Paper 10, London.

6. "Prevention of Occupational Eystrain - Hazards of VDU's", Health and Safety Monitor No. 9, February 1981, Association of Scientific, Technical and Managerial Staffs, London.

Sweden

7. "Towards Standards and Threshold Limit Values for Visual Work", OSTBERG, O, in "Current Concepts in Ergophthamology", TNEGROTH, B and EPSTEIN, D (Eds), Stockholm: Societas Ergophthamologica Internationalis, (Distributed by Department of Ophthalmology, Karolinska Institutet, 104 01 Stockholm, Sweden).

Switzerland

8. "Encyclopaedia of Occupational Health and Safety", Third (Revised) Edition 1983, PARMEGGIANI, L (Technical Editor), Volume 2, International Labour Office, Geneva.

9. "Postural and Visual Loads at VDT Workplaces", LAUBLI, Th; HUNTING, W, GRANDJEAN, E; Department of Hygiene and Ergonomics, Swiss Federal Institute of Technology, Zurich, in "Ergonomics", 1981, Volume 24, No. 12, 933-944.

10. "Work on Visual Display Units: Risks for Health", CRESPY, J; REY, P; World Health Organisation, Geneva, WHO/OCH/83.2.

United States

11. "An Evaluation of Radiation Emission from Video Display Terminals", Division of Compliance, U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration, Bureau of Radiological Health, February 1981.

12. "Health Issues in VDT Work", SMITH, M J, Motivation and Stress Research Station, Applied Psychology and Ergonomics Branch, Division of Biomedical and Behavioural Science, National Institute for Occupational Safety and Health Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services, August 1982.

13. "An Investigation of Health Complaints and Job Stress in Video Display Operation", SMITH, M J; COHEN, B G F; STAMMERJOHN, L W Jr.; in "Human Factors", 1981, 23(4), 387-400.

14. "Report of a Cross-Sectional Survey of Video Display Terminal (VDT) Users at the Baltimore Sun", SMITH, A B; TANAKA, S; HALPERIN, W; National Institute for Occupational Safety and Health Centers for Disease Control, U.S. Public Health Service, Robert A Taft Laboratories, Ohio; and RICHARDS, R D; Department of Ophthalmology, University of Maryland Hospital, Maryland; Preliminary Report: June 1982; Final Report: September 1982.