

Proposed Computer Acquisition for Repatriation General Hospitals



Joint Committee of
Public Accounts



JOINT COMMITTEE OF PARLIAMENTARY ACCOUNTS
REPORT 249
PROPOSED COMPUTER ACQUISITION FOR
REPATRIATION GENERAL HOSPITALS

Abbreviations and Glossary

ADP	- Automatic Data Processing
ADT	- Admissions, Discharges and Transfers - the hospital functions normally automated first.
AIMS	- Australian Inpatient Management System (see APMS)
AMDAHL	- Manufacturer of IBM-compatible computers
APMS	- Australian Patient Management System (see AIMS)
Brand Report	- Report entitled Review of the Repatriation Hospital System chaired by Dr I Brand
C of E	- Certificate of Exemption
CPU	- Central Processing Unit with which the software running on a computer is executed
DEC	- Digital Equipment Corporation
Disc Report	- Consultancy Review of the Proposed PCS Package Implementation at Repatriation General Hospitals, Disc
DOLGAS	- International Pty Limited
DOLGAS	- Department of Local Government and Administrative Services
DVA	- Department of Veterans' Affairs
ECHO	- The Electronic Computing Health Oriented user group is a group of IBM users engaged in health and health related fields. PCS users exchange information and software via ECHO
IBM	- International Business Machines Australia Limited
IBM-compatible	- non IBM computers capable of executing IBM software
integrated hospital information system	- An on-line real-time hospital computer system with up to date centralised storage of patient details able to be accessed from all sections of the hospital and with information flows between sections largely handled by a data communications network

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JCPA	- Joint Parliamentary Committee of Public Accounts
LINC	- Burroughs fourth-generation language
MIPS	- Million instructions per second - one crude measure of the power of a computer
MEDILINC	- Burroughs integrated hospital software
MVS/XA	- Multiple Virtual Storage/Extended Architecture - IBM's latest operating system for its larger computer offerings
NCC	- National Computing Centre
NPP	- New Policy Proposal
PCS	- Patient Care System
PCS/ADS	- The Applications Development System of the PCS project. It is a 4th-generation language which enables users to productively develop their own system
PMI	- Patient Master Index - A data base containing information about patients, their medical details and their progressive treatments while in hospital
RAH	- Royal Adelaide Hospital
RFT	- Request for Tender
RGH	- Repatriation General Hospital
Submission	- Department of Veterans' Affairs, Acquisition of Computing Facilities for Installation in the Repatriation General Hospital, Reference to Joint Parliamentary Committee of Public Accounts - the DVA proposal document
Supplement	- Supplement to the Reference to the Joint Parliamentary Committee of Public Accounts on Repatriation General Hospital Computing Facilities - the DVA response to questions raised by the Committee in relation to the DVA Submission
THIS	- Total Hospital Information System marketed by McDonnell Douglas Information Systems

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

JOINT COMMITTEE OF PUBLIC ACCOUNTS

REPORT 249

PROPOSED COMPUTER ACQUISITION FOR REPATRIATION
GENERAL HOSPITALS BY THE DEPARTMENT OF VETERANS' AFFAIRS

Australian Government Publishing Service
CANBERRA 1986

JOINT COMMITTEE OF PUBLIC ACCOUNTS

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SECTIONAL COMMITTEE ON AUTOMATIC DATA PROCESSING

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B J CONQUEST, MP

DR A C THEOPHANOUS, MP

L R S PRICE, MP

R E TICKNER, MP

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.

PREFACE

This report outlines the findings of the Committee's inquiry into the proposed computer acquisition for Repatriation General Hospitals by the Department of Veterans' Affairs.

On 6 June 1984, the Minister for Finance moved in the House that:

in accordance with paragraph 8 (1) (d) of the Public Service Accounts Committee Act 1951, this House refers to the Joint Committee of Public Accounts for investigation and report as necessary from time to time, the proposed purchase of automatic data processing facilities by the Commonwealth, or any department or authority of the Commonwealth staffed under the Public Service Act 1922, notification of intention of which is to be conveyed to the Committee by the Minister responsible for the intending purchaser.

This inquiry is the first undertaken by the Joint Committee of Public Accounts under its standing reference to examine and report on major computer acquisition proposals before they proceed to Cabinet for approval of funds.

The Minister for Finance indicated that early consideration of issues well before the commitment of financial and other resources was necessary. Some major issues which he stated needed further and independent scrutiny included:

- employment consideration;
- Australian Industry Participation;
- industrial issues;
- needs;
- cost effectiveness; and
- risks.

In his speech the Minister indicated:

A major factor considered by the Government was the potential for delay which might be introduced into the acquisition process by protracted scrutiny. It is necessary for the right balance to be achieved between the need for careful examination and the timely implementation of worthwhile projects.

The new procedures are designed to ensure that departments and authorities apply themselves assiduously to the planning process. The early submission of a proposal arising from that planning and the consideration of the proposal will be early steps along a path leading to the eventual acquisition of computing facilities. The essential review and independent scrutiny process will thus be completed before any major commitment of public moneys is made.

Senator Guilfoyle indicated in the Senate on 7 June 1984 that these areas would be considered as part of a checklist that the Committee would pursue in looking at proposals that had been referred to it. On 21 May 1985, the Committee issued guidelines indicating the issues which Departments should address in their submissions. Subsequent experience has indicated there are some areas where the guidelines could be improved. The Committee therefore intends to issue revised guidelines when the Committee has had the experience of a small number of inquiries.

The Department of Veterans' Affairs proposed computer acquisition for Repatriation General Hospitals was approved by Cabinet and funds of \$2.6m were included in the 1985-86 budget subject to advice from the Minister for Finance. The Minister for Finance subsequently advised the Minister for Veterans' Affairs on 1 August 1985 that no expenditure should occur until a satisfactory report on the proposal had been received from the Joint Committee of Public Accounts.

The Committee is concerned that this proposal was not referred to it directly as a result of a Cabinet decision as envisaged under the arrangements agreed between the Committee and the Minister for Finance. It also notes that the intention of the reference was, as the then Minister for Finance, Mr Dawkins stated in his speech, to ensure proposals are subject to independent review outside the budget cycle and well in advance of any decision to commit funds. This clearly has not been the case for this proposal where funds have already been approved for the current 1985/86 budget subject to a satisfactory report from the Committee.

The Committee is unequivocally of the view that all proposals should be referred to the Committee by Cabinet itself and well in advance of any request for, or approval of funds.

On 18 October 1985, the Committee informed Departments that unless the Committee is given formal notification of intention to bring a proposal before it within a month of the relevant Cabinet decision, and the submission in support of that proposal is received by 30 September, the Committee may not be able to rearrange its program so as to guarantee a report to Parliament before Budget Cabinet consideration in the following year.

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The Department of Veterans' Affairs reference and submission were received by the Committee on 24 October 1985. The Committee was at that time fully committed on another ADP inquiry and, was therefore unable to schedule public hearings on the proposal until the autumn sitting of Parliament in 1986.

The Committee found that the original submission from the Department of Veteran's Affairs did not provide sufficiently comprehensive information about the nature of the proposal and its justification to allow it to reach informed conclusions about its merit. This was to some degree a consequence of this being the first proposal to come before the Committee under this standing reference.

The Committee therefore requested further information on 12 February 1986 and the Department supplied the additional information on 5 March 1986. After the hearing on 20 March 1986, the Committee sought further information which was supplied on 1 April 1986.

The inadequacies of the original submission and the necessity to seek further clarifying information from the Department have inevitably caused some delay in the Committee's examination and report on the proposal. However, the Committee wishes to indicate to Ministers bringing proposals before the Committee that the quality of the information provided in submissions must influence the speed with which the Committee's inquiries can be expedited.

The Committee wishes to acknowledge the work done by departmental officers in responding to the Committee's requests for information and by the secretariat in preparing the material. The Committee also wishes to thank Mr Darryl Erbacher for his contribution to this Report while seconded to the Committee's secretariat from the Australian Bureau of Statistics.

Senator G Georges
Chairman

M J Talberg
Secretary
Public Accounts Committee
Parliament House
CANBERRA ACT
4 June 1986

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Notes

1. The Australian Inpatient Management System (AIMS) and the Australian Patient Management System (APMS) are mentioned in numerous places in the body of this report. They are in fact two names for the same system. The system was known by the acronym AIMS during the period of DVA's involvement with IBM on the development of the system prior to its announcement. On 1 April 1986 IBM announced its product and referred to it with the acronym APMS.

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integrated hospital information system	an on-line real-time hospital computer system with up to date centralised storage of patient details able to be accessed from all sections of the hospital and with information flows between sections largely handled by a data communications network

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THIS	Total Hospital Information System marketed by McDonnell Douglas Information Systems

CHAPTER 1

SUMMARY OF FINDINGS

- Introduction
- Major Conclusions and Recommendations
- The PCS Project
- The Current Proposal
- General Conclusions and Recommendations for Future Computer Projects

Introduction

1.1 This chapter highlights the major features of the Committee's examination of the proposal by the Department of Veterans' Affairs to acquire computers and software for its Repatriation General Hospitals. Readers should refer to the relevant section in Chapter 3 for a fuller discussion. Conclusions and recommendations in this Chapter are cross-referenced to the relevant locations in the text. The full list of Committee conclusions and recommendations are included in Chapter 4.

Major Conclusions and Recommendations

1.2 The Committee concludes that:

- the Department of Veterans' Affairs has not to date conducted the Patient Care System project in a manner consistent with existing planning guidelines and sound project management practices;
- there is a need for improved hospital services for the veteran community;
- Repatriation General Hospital management and staff operate under difficulties due to inadequate computer systems;
- the computing systems at Repatriation General Hospitals generally lag well behind those available in other public hospitals; and

- some form of integrated hospital information system is the most effective way for the Department of Veterans' Affairs to proceed to satisfy Repatriation General Hospital information requirements and that the Patient Care System offers the only appropriate vehicle to achieve this in an IBM compatible environment.

1.3 The Committee recommends that:

- the Department of Veterans' Affairs proceed with its negotiations with the Department of Finance and the Department of Local Government and Administrative Services with a view to the acquisition of computers for the Repatriation General Hospitals;
- the Department of Veterans' Affairs supply the Committee, with comments from the Department of Finance, information on computer capacity requirements before placing an order for a computer at Repatriation General Hospital Concord;
- the Department of Veterans' Affairs respond to the other Committee recommendations through the Minister for Finance Minute mechanism prior to proceeding beyond the purchase of the Concord computer;
- the Department of Local Government and Administrative Services decides on the method of acquisition; and
- should the Department of Local Government and Administrative Services accept the arguments put to it by the Department of Veterans' Affairs for a Certificate of Exemption for an IBM computer for Repatriation General Hospital Concord, a supply and development contract be concurrently negotiated with IBM which ties further development and support for the Patient Care System related software to the initial IBM computer acquisition.

The PCS Project

1.4 The Department of Veterans' Affairs has made a number of attempts to initiate a project to construct an integrated hospital information system for its Repatriation General Hospitals (RGH). Previous attempts have been characterised by a lack of proper analysis of requirements, poor project management and decision making and lack of vendor support for the chosen software. The DVA has attempted during the last 18 months to place the project on a sounder footing. Much still needs to be carried out to establish the project and a satisfactory management and consultative framework which would guarantee a successful implementation.

1.5 The broad objectives of the project are consistent with the trend in the hospital software industry but the DVA have not demonstrated by detailed data and functional analysis that these broad objectives are fully appropriate to meet RGH requirements. The DVA is currently conducting, in conjunction with a consultant, a detailed data analysis study which on the current schedule will not be complete before hardware and software purchases are made.

1.6 Functional analysis will be carried out as part of the process of acquiring software modules from overseas or from IBM.

1.7 The Committee concludes that:

- the Patient Care System project has been delayed for a considerable period of time as a result of poor decision making, misunderstanding and mismanagement. (Paragraph 3.42).

The Committee recommends that:

- the Department of Veterans' Affairs make maximum use of its already established committee structure to ensure that the Department's commitment is translated into the necessary support and guidance to create a healthy project team environment for systems implementation. (Paragraph 3.43).

1.8 The Committee concludes that:

- there is an urgent need to complete the data analysis and carry out a functional analysis of hospital functions prior to acquisition of software modules. (Paragraph 3.15).

1.9 In determining the cost effectiveness of the project, the DVA has not analysed adequately a number of alternative options to that which is proposed. The DVA has proposed a decentralised RGH based computer system. The cost/benefit analysis for the proposal is based on a comparison with the current partially automated, but largely manual, procedures. No other alternatives were canvassed in the cost/effectiveness analysis. It is not therefore possible to conclude that the approach proposed is the most cost effective.

1.10 An approach based on supporting RGH requirements from the Department's NCC was rejected on qualitative grounds with insufficient examination.

1.11 The Committee concludes that:

- although a centralised option based on a National Computer Centre was dismissed on qualitative grounds, it deserved serious quantitative evaluation; and

- the case for a decentralised, as opposed to centralised, strategy was insufficiently examined. (Paragraph 3.178).

1.12 The Committee recommends that:

- the Department proceed with the acquisition of Repatriation General Hospital computers on the grounds that:
 - the Department is now heavily geared to the decentralised option;
 - other National Computer Centre actions are already in hand; and
 - no clear evidence exists to recommend other options. (Paragraph 3.179).

1.13 The Committee concludes that:

- the cost/benefits analysis carried out by the Department of Veterans' Affairs for this project is deficient in the following respects:
 - the Department of Veterans' Affairs has not presented its project costing data in a comprehensive and consistent manner thereby making it difficult for the Committee to reach confident conclusions about the total costs and the benefits of the proposal;
 - discrepancies exist in the cost estimates and some costs appear to have been omitted;
 - the estimated benefits appear to be conservative and were not determined for the full range of software expected to be acquired or developed;
 - other unquantified benefits will accrue to the proposal; and
 - intangible benefits, such as better health care and patient convenience, will also accrue to the project. (Paragraph 3.98).

The Committee recommends that:

- the Department of Veterans' Affairs institute a cost monitoring and control system such that accurate, timely and comprehensive project costing information is readily available to the Department of Veterans' Affairs management and external regulatory authorities; and

- the Department of Veterans' Affairs report to the Department of Finance its revised estimates of the Patient Care System project costs and benefits, any subsequent change in direction of the Patient Care System project and any increase in costs or additional cost to be incurred under the auspices of this project. (Paragraph 3.131).

1.14 The Committee concludes that:

- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realised. (Paragraph 3.194).

1.15 The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved. (Paragraph 3.196).

1.16 The DVA require a computer which will be the equivalent in size of an IBM 4381 machine and compatible with IBM hardware for the RGHs. Insufficient sizing information has been supplied to convince the Committee of the justification for the initial surplus capacity of RGH computers, of the rate at which RGHs will increase their use of computing capacity and whether Concord and Heidelberg RGHs require additional capacity above the base 4381 equivalent capacity.

1.17 The Committee recommends that:

- the Department of Veterans' Affairs supply to this Committee a chart of expected demand for computing capacity before any order is placed for a computer for both Concord and Heidelberg Repatriation General Hospitals. The chart should differentiate the expected computer capacity usage of the various hospital software modules as their usage rises over time. (Paragraph 3.147).

1.18 The Committee concludes that:

- it is doubtful whether the Patient Care System team, which has yet to be fully restaffed and gain the full Patient Care System experience, will be able to affect the scheduled workload in the draft Patient Care Project Plan. (Paragraph 3.188).

The Current Proposal

1.19 The DVA proposes to acquire an IBM 4381 computer for Concord RGH under a Certificate of Exemption and to proceed to issue an RFT for IBM 4381 equivalent computers for the other RGHs.

1.20 A number of integrated hospital information systems are marketed in Australia currently. Systems which run on other than IBM-compatible computers appear to have varying capabilities which may rival PCS in functionality. No system appears, to the Committee, to be clearly superior to PCS.

1.21 The DVA has argued that computers for RGHs should be IBM-based because of the Department's investment in support. The Committee accepts these arguments for acquiring IBM compatible equipment.

1.22 The Committee concludes that:

- for the Department of Veterans' Affairs' purposes the alternative, non IBM-compatible, integrated hospital information systems do not offer advantages over the Patient Care System;
- the Patient Care System appears to be the only suitable system for the Department of Veterans' Affairs in the IBM-compatible market; and
- any tendering process should be restricted to the IBM-compatible market. It notes that the Department of Local Government and Administrative Services is in agreement with this view. (Paragraph 3.56).

1.23 The Committee is concerned that decisions with relatively small direct funding implications to buy software products may subsequently provide grounds for a Certificate of Exemption for major hardware acquisition. When the DVA purchased PCS in 1983/84 the Committee understands that the DVA's intention was to make minor modifications to the software and operate it on its Amdahl computer. This initiative proved not to be possible.

1.24 The Committee concludes that:

- at the time of the purchase of the Patient Care System, the Department of Veterans' Affairs did not recognise the implications of its software acquisition; but
- earlier mismanagement of the Patient Care System project and underestimation of the nature and size of the project have played a role in the Department's decision to seek a Certificate of Exemption for the Concord Repatriation General Hospital computer. (Paragraph 3.80).

1.25 The Committee recommends that:

- departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications. (Paragraph 3.81).

1.26 The DVA has argued for the granting of a Certificate of Exemption for an IBM computer for Concord RGH.

1.27 The Committee concludes that:

- a case exists for the Department of Veterans' Affairs to call tenders for IBM-compatible equipment, and the acquisition and support for the Australian Patient Management System to determine the level of support for the Patient Care System in the marketplace;
- there may be a case for the granting of a Certificate of Exemption in favour of IBM for the Concord Repatriation General Hospital computer based on the special level of support for the Patient Care System that the Department of Veterans' Affairs claim they require from IBM; and
- the decision on the method of acquisition properly rests with the Department of Local Government and Administrative Services. (Paragraph 3.82).

1.28 The Committee concludes that:

- no arguments exist for the Department of Veterans' Affairs restricting or avoiding public tendering in order that available funds be expended in 1985/86. (Paragraph 3.95).

1.29 The Committee recommends that:

- the acquisition proceed expeditiously commensurate with proper tendering procedures. (Paragraph 3.96).

General Conclusions and Recommendations for Future Computer Projects

1.30 The Committee recommends that:

- departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications. (Paragraph 3.81).

1.31 The Committee concludes that:

- in most instances, the quantification of benefits, resulting from computer acquisitions stating levels of variance and uncertainty, is a practicable and useful process and should be undertaken; and
- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realized. (Paragraph 3.194).

1.32 The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved. (Paragraph 3.196).

CHAPTER 2

INTRODUCTION

- Background
- The Proposal
- History of Involvement with PCS by the Department of Veterans' Affairs
- Patient Care System (PCS)
- Other Hospital Software available in Australia
- Brand Report

Background

2.1 The Department of Veterans' Affairs (DVA) uses an Amdahl 580/5860 computer to support the bulk of its current data processing activities. The computer currently has 24 million bytes of memory, a data communications network of 1200 terminals, and is housed in the National Computing Centre (NCC) in the Grace Building, George Street, Sydney. This computer supports Central Office and Branch Office data processing requirements as well as allowing Repatriation General Hospitals (RGHs) access to central data bases. In addition, RGHs use a computer system for processing patient Admissions, Discharges and Transfers (ADT) which also operates on the NCC computer.

2.2 The ADT system operates on a data base of hospital patient information called the Patient Master Index (PMI) and together with the functions of the ADT system constitute the core elements of any integrated hospital information system. The current ADT system was constructed in the early 1970s and displays the limitations of systems of that era. It has been progressively modified over the years. Modifications are becoming increasingly difficult and the system does not provide a suitable base from which to expand to an integrated hospital information system.

2.3 In order to deliver a high quality of health care with efficiency and convenience to patients and to satisfy the requirements of RGHs to provide hospital and related services to an ageing veteran population, the DVA is seeking to upgrade the computing capacity and facilities available to RGHs.

The Proposal

2.4 The DVA proposal document is entitled 'Department of Veterans' Affairs, Acquisition of Computer Facilities for Installation in the Repatriation General Hospitals, Reference to Joint Parliamentary Committee of Public Accounts, 24 October 1985', hereafter referred to as the Submission and is included in Appendix 1.

2.5 The Committee's advisers examined the Submission and requested further information in a letter dated 12 February 1986 which is included as Appendix 2. The DVA responded with a document entitled 'Supplement to the Reference to the Joint Parliamentary Committee of Public Accounts on Repatriation Hospital Computing Facilities' which is hereafter referred to as the Supplement and included in Appendix 3. Following the public hearing the Committee wrote to DVA requesting answers in writing to questions which time constraints precluded from being addressed at the hearing. The DVA responded with a document entitled 'Joint Parliamentary Committee of Public Accounts, Questions Asked in Writing of the Department of Veterans' Affairs, 24 March 1986'. This document is included in the Minutes of Evidence and is hereafter referred to as Answers to Supplementary Questions.

2.6 The DVA proposes to acquire and install 5 medium scale IBM-compatible computing facilities in its 5 mainland capital RGHs at an equipment cost of \$10m over the 4 years 1985/86 to 1988/89. The proposal was the subject of a New Policy Proposal to Government in February 1985 the costings of which were amended in August of 1985. Cabinet agreed to the proposal and the Minister for Finance advised his agreement, on a provisional basis, to the inclusion of \$2.6m in the 1985/86 Budget. He directed that no expenditure should be incurred before a satisfactory report was received from the Joint Parliamentary Committee of Public Accounts (the Committee) and also requested advice from DVA about the action DVA had taken in relation to the recommendations of the Review of the Repatriation Hospital System, Chairman Dr I Brand, June 1985 (Brand Report).

2.7 The DVA has argued that the computers proposed for installation in the RGHs should be IBM-compatible on the grounds that the Department has a major investment in, and operations experience of, IBM-based systems, and the RGHs are dependent on the Department's database of client information held at the NCC. RGH veteran patients are clients of the Department and the treatment of veteran patients requires access to the client data base.

2.8 The DVA has argued that the first computer, which will be installed at Concord RGH should be an IBM computer. It asserts that the only satisfactory approach to the development of modern integrated hospital information systems lies in the use of vendor supported applications software and development tools. In an IBM-compatible environment the only suitable available product in Australia is the IBM Patient Care System (PCS) and DVA has indicated that with its current resources and expertise it is unable to implement PCS in the RGHs without substantial support from IBM. It is argued that the acquisition of the remaining 4 computers need not be subject to the IBM requirement as DVA will be responsible for transferring any systems, tested at the initial Concord site, to other RGHs.

2.9 The DVA therefore proposes to request the Department of Local Government and Administrative Services (DOLGAS) to issue a Certificate of Exemption (C of E) from public tender in order to acquire an IBM computer to be installed at RGH Concord, and to issue a Request for Tender (RFT) for IBM-compatible computers for the other RGHs.¹

2.10 The proposed computer for RGH Concord is an IBM 4381 Group 2 Processor. At the time of the preparation of the Submission, IBM marketed Model Groups 1, 2 and 3 in its 4381 range of computers. Since then, IBM have announced Model Groups 11, 12, 13 and 14 which have superior price/performance characteristics and have withdrawn the Model Groups 1, 2, and 3 from sale. This marketing change does not affect the qualitative arguments. A list of the equipments to be acquired for RGH Concord is contained in Appendix 1 of the Supplement.²

2.11 Because a suitable building is not available at Concord and may not be available until late 1986, the DVA plans to install the IBM computer and PCS for Concord RGH temporarily in IBM premises prior to transferring and reinstalling it in Concord RGH. The DVA will then commence staff training and complete related development work.

2.12 The DVA proposes to acquire from IBM the PCS software to form the core of its integrated hospital information system. To this end, DVA has been involved in a joint development as junior partners with IBM and Royal Adelaide Hospital (RAH) to produce a version of PCS suitable for conditions in Australian hospitals. This software, called Australian Patient Management System (APMS), which is a modified version of software marketed by IBM in the USA and elsewhere, was announced in Australia by IBM on 1 April 1986.

2.13 PCS is used by more than 250 hospitals, mostly in the USA. These hospitals and USA software houses have developed for their own needs, or for commercial reasons, a large number of additional hospital software modules using a specialised fourth generation language Patient Care System/Applications Development System (PCS/ADS). The DVA plans to investigate the range of software modules available and to implement them, after necessary modification, as a means to producing its integrated hospital information system.

2.14 The gains that DVA sees as accruing from the use of PCS include improved quality of patient care and treatment, introduction of more efficient scheduling of patient services and the reduction of time and effort associated with patient admission and discharge. The DVA anticipates significant dollar

1. Joint Parliamentary Committee of Public Accounts, Proposed Computer Acquisition for Repatriation General Hospitals by Department of Veterans' Affairs, Minutes of Evidence, pages 12,30.
2. Appendix 3, page 225.

benefits (mainly by improved scheduling) through improved information systems amounting to \$17m in 1985 dollar costs over the 5 years from 1985/86 to 1989/90.³ The Consultancy Review of Proposed PCS Package Implementation at Repatriation General Hospitals, Disc International Pty Limited, July 1985, is hereafter referred to as the Disc Report.

History of Involvement with PCS by the Department of Veterans' Affairs

2.15 In the early 1970's the DVA developed a major terminal-based, database system addressing the admission, discharge and transfer of RGA patients. The current system has reached the end of its economic life and is an unsuitable base from which to expand to an integrated hospital information system.

2.16 In 1980 following an overseas inspection visit, DVA proposed PCS as the only proven system capable of meeting the specified needs, and of operating on the Department's only major computing facility at the NCC. The case was accepted by the then Department of Administrative Services (DAS) and the Department of Finance. Funds were provided in 1981/82 for the PCS package. Funds were also provided for a new computer to meet both the PCS requirements and an expanded NCC workload. The cost/benefit case for a 'turn-key' installation of both PCS applications software and computer was subsequently rejected and the cheapest hardware (without software) was acquired from Amdahl. IBM then would not co-operate in developing a DVA version of PCS on an Amdahl computer and the project was abandoned.

2.17 The project was resurrected in 1982/83, funds were allocated and the USA version of the product acquired in 1983/84. During this period RAH had acquired PCS and were modifying it to meet their requirements. On the basis of the apparent success of RAH and, in the absence of strong local support from IBM, DVA initiated an in-house project in September 1984 to modify the PCS software. The initiative was not successful. (Refer paragraph 28.22, Brand Report.) Meanwhile, RAH had successfully modified the USA version of the product and were using it for productive purposes but in doing so had produced a version of the product that could not be integrated with the wide range of other software developed in the USA using PCS/ADS. The additional PCS software was designed to operate in conjunction with the core PCS software module acquired from IBM.

2.18 Subsequently in 1985, IBM established, as part of a marketing strategy for the south west Pacific hospital market, the IBM Health Industry Centre and entered into a joint development with RAH to produce a version of PCS suitable for Australian hospital conditions and compatible with the USA PCS software. The DVA then entered a joint development with IBM and RAH ensuring that DVA's requirements were included in the product, APMS, which was announced by IBM on 1 April 1986.

3. Disc International Pty Limited, Consultancy Review of Proposed PCS Package Implementation at Repatriation General Hospitals, Final Report, July 1985, page 24.

2.19 The DVA plans to use pre-release versions of the APMS software during 1986 to facilitate training and implementation scheduling and planning.

Patient Care System (PCS)

2.20 The PCS software product is marketed by IBM in the USA. It is to be marketed in Australia as two separate components. The Patient Care System/Applications Development System (PCS/ADS) is a form of fourth generation language which can be used by hospital computing staff to construct hospital information software modules. The greater proportion of PCS modules available in the USA have been constructed by individual hospitals using this system.

2.21 The second component to be marketed by IBM (APMS) is a Patient Master Index/Inpatient Management system which consists of a data base for patient information and software developed using PCS/ADS to process admissions, discharges and transfer of patients.

2.22 Together with IBM-developed modules and software house developed modules, existing user hospitals have produced in the order of 150 hospital software modules.⁴ In order to use these modules effectively under Australian conditions some modification will be necessary. The PCS Users Group (ECHO) is particularly active and facilitates the exchange of individually developed software modules.

2.23 The system's flexibility stems from the use of the PCS/ADS language. In addition, terminal screen formats and report formats are easily changed to support the needs of individual hospitals.

2.24 The PCS system is able to be run on IBM 4300 and 3000 series computers.

2.25 The Committee understands that IBM are engaged in a number of joint developments in Australia to produce further modules for the Australian environment.

Other Hospital Software Available in Australia

2.26 Excluding one-off developments by individual hospitals, there appear to be three major hospital information systems besides PCS, available in Australia which have capabilities of the kind DVA are seeking. These are:

- MEDILINC supplied by Burroughs Ltd;
- Total Hospital Information System (THIS) supplied by the Health Services Division of McDonnell Douglas Information Systems Pty Ltd; and

4. Appendix 3, pages 246-249.

- the NSW Department of Health's in-house developed range of hospital software.

2.27 Burroughs offer MEDILINC which consists of a Patient Master Index, admissions, transfers and discharges functions and patient accounting. The system has been constructed in Australia using LINC, Burroughs' fourth generation language. It is easily extended by individual hospitals.

2.28 It is reported that currently five Australian hospitals use MEDILINC including Frankston, Royal Canberra and Woden Valley hospitals. Burroughs plan to market the system in a number of overseas countries.

2.29 THIS was originally developed by Computer and Data Services of Australia Pty Ltd (CDSA) with first releases in 1978. In 1985 CDSA was taken over by McAuto, the Health Services Division of McDonnell Douglas Information Systems Pty Ltd. The system runs on the McDonnell Douglas Sequel computer.

2.30 The Committee understands that McDonnell Douglas software is used in over 100 health care institutions in Australia utilising THIS components. St Vincent's Private and Austin hospitals are substantial users of THIS software.

2.31 The Committee understands that THIS consists in the order of 60 modules ranging from patient master index and theatre bookings to payroll administration and linen cost control.

2.32 The New South Wales Department of Health develops and supplies hospital information software to NSW public hospitals. This software runs on Digital Equipment Corporation (DEC) VAX computers and micro computers. The Department has in the order of 20 modules available for use in hospitals and as many modules planned or under development. Currently, approximately 40 public hospitals are supported by DEC computers either on their premises, by using a regional computer centre, or by the Department's central installation. The Department has a 4 year contract with DEC for the supply of computers which expires in 1986.

Brand Report

2.33 Of relevance to the Committee's considerations of the Department of Veterans' Affairs proposal is the report which was presented in June 1985 by Dr I Brand entitled 'Review of the Repatriation Hospital System' (Brand Report). The terms of reference for the Brand inquiry announced by the Minister for Veterans' Affairs were:

- identify deficiencies in resource and administration procedures which inhibit the hospitals from delivering a high quality of care with efficiency and convenience to patients;

identify the requirements for the further development of the hospitals and related services to an ageing Veteran population to the end of the next decade; and

- make recommendations to correct any such deficiencies and to meet those requirements.

2.34 Chapter 28 of the Brand Report is entitled 'Automated Data Processing'. This chapter makes a number of criticisms of aspects of computer processing for RGAs, a number of observations and a number of recommendations. This chapter is included as Appendix 4.

2.35 The Minister for Finance in his letter to the Minister for Veterans' Affairs on 1 August 1985 indicated that:

Your approach to the JCPA will, of course need to address the comments made in the Brand Report.

2.36 Attachment A of the DVA's Submission includes a list of recommendations from the Brand Report together with actions required and in hand. Individual recommendations and implementation progress is discussed in Chapter 3.

CHAPTER 3
MAJOR ISSUES

- Matters Arising from the Brand Report
- Method of Acquisition
- Cost/Benefits
- Estimation of CPU Capacity Requirements
- Location of Computer at NCC Site or RGH Sites
- Rate of Implementation
- Performance Monitoring
- Potential Participation by Australian Software Industry in Hospital Systems
- Transfer of RGHs to States' Hospital Systems

3.1 This Chapter addresses the issues which the Committee has identified to be the most important associated with the Department of Veterans' Affairs (DVA) proposal. The DVA was questioned on these issues at the public hearing on 20 March 1986 and subsequently in writing in a letter of 24 March 1986. The DVA responses to this letter, which includes both questions and answers, have been incorporated in the Minutes of Evidence of the hearing of 20 March 1986.

Matters Arising from the Brand Report

3.2 The Review of the Repatriation Hospital System (Brand Report) was submitted by Dr I Brand, Chairman of the review committee on 28 June 1985. Chapter 28, Automated Data Processing (ADP), contains most of the criticisms, findings and recommendations made by the review committee that are relevant to the ADP requirements of RGHs. Chapter 28 of the Brand Report is at Appendix 4.

3.3 The Minister for Finance, in advising his agreement on a provisional basis to the inclusion of \$2.6m in the 1985/86 Budget for the DVA proposal, indicated that criticisms could be made if the comment and recommendations of the Brand Review were not addressed. He highlighted the Brand Review's

criticism of a lack of overall strategy for ADP in hospitals and that the ADP Survey on which the proposal was based did not adequately deal with the computing needs of hospitals. The Minister drew attention to one recommendation 'that a study be undertaken by an independent body in consultation with the hospitals of the full data processing requirements of the hospitals and how best to supply these requirements'.¹ This recommendation is discussed below. The DVA's Submission to the Committee included a listing of the relevant Brand recommendations at Attachment A which were submitted to the Repatriation Commission and which were subsequently accepted for remedial action.² A number of these recommendations are currently not addressed or are in the process of being addressed.

Analysis of User Requirements

3.4 The Brand Report stated that 'the only mention of the hospitals in the recently completed ADP survey [Development of a Future Computing Services Environment for the Department of Veteran's Affairs, Ferris Norton Associates, January 1985] is in relation to the Patient Care System [PCS].³ Also 'a major reason for the lack of progress [in satisfying the needs of RGHs] has been the centralised approach in trying to provide global solutions to individual hospital needs'.⁴ 'No overall strategy for ADP in hospitals has been developed.'⁵ 'Many computing systems were developed only for Concord, and the other States were forced to accept these systems'.⁶ Concord staff indicated 'that the systems were primarily developed on the basis of what [Central Office] CO ADP staff believed the hospitals should have'.⁷

3.5 As a consequence of the above criticisms the Brand Report recommended that:

a study be undertaken by an independent body in consultation with the hospitals of the full data processing requirements of the hospitals and how best to supply these requirements⁸

The DVA Submission indicates in Attachment A that the first of these consultancies began in June 1985.⁹ The Committee presumes that the Consultancy Review of Proposed PCS Package Implementation at Repatriation General Hospitals by Disc International (Disc Report), is referred to, but the Disc Report did not address data processing requirements by either a data analysis or functional analysis study.

1. Appendix 4, page 307.
2. Appendix 1, page 112.
3. Appendix 4, page 304.
4. Appendix 4, page 304.
5. Appendix 4, page 304.
6. Appendix 4, page 304.
7. Appendix 4, page 305.
8. Appendix 4, page 307.
9. Appendix 1, page 120.

3.6 The DVA approach to the development of its integrated hospital management system concept is to acquire in the first instance the Australian Patient Management System (APMS) which is the foundation for other patient-based software. APMS is a version of software marketed by IBM in the USA which has been modified for Australian conditions. The DVA plan is, as soon as possible, to enter into a joint development arrangement with IBM, subject to the initial acquisition proposal proceeding and to develop additional modules to those in APMS.¹⁰ The first of these will be an Outpatient Appointment Scheduling software module.

3.7 The DVA Supplement states that:

Future PCS modules, which will build upon the patient data base and be developed or enhanced using the PCS Applications Development System, will affect other areas of hospital activity including outpatient departments, wards, laboratories, allied health and pharmacies. Proposals have yet to be formulated for these systems. Priorities for their implementation, which could differ between RGH's have yet to be considered.¹¹

3.8 Under DVA's scheme¹²:

progress will be conditioned by the availability of resources to review requirements and to propose and implement solutions [by constructing modules meeting these requirements]. Individual hospitals will set system priorities and determine enhancements/modifications to 'packaged' solutions.

No attempt has been made to assess long-term system priorities in an environment of evolving RGH awareness of requirements and of PCS product development and packaged solutions.

3.9 In the absence of detailed knowledge of RGH user requirements, the DVA point to the experience of the 250 hospitals in USA and the rest of the world that have implemented hospital management systems using PCS. The evidence from this experience indicated that the creation of the central data base of patient information called the Patient Master Index (PMI) is the first essential step towards an integrated information system. Data items must be easily added to this data base as additional functions are added. It is also vital that the PCS modules can be modified easily to meet RGH specific functionality requirements.

10. Method of Acquisition, Chapter 3, page 28.

11. Appendix 3, page 172.

12. Appendix 3, page 173.

3.10 The DVA has documented some 200 software modules from which it can choose as it progressively implements its hospital functions. On the one hand the DVA argued that hospitals have many functions in common and that the DVA should be able to choose a suitable software module for any function the DVA decides to implement after it has carried out a detailed user requirements analysis for that function. The DVA also argued that since all the available software modules access that PMI data base, the integration should not be a problem. However, as highlighted above, the Brand Report criticised the provision of global systems where some needs were unique to individual hospitals.

3.11 The Committee is of the opinion that sound system development practices dictate that a complete analysis of user and system requirements should be carried out prior to the first implementation steps. Even if implementation proceeds in a stepwise manner, and this is a highly desirable way to proceed, prior analysis of user requirements and overall design strategy are necessary to provide a solid basis for each implementation step. In this regard the Committee agrees with the Brand Report recommendation for an overall assessment of ADP needs in hospitals.

3.12 While clearly the DVA has knowledge of hospital computing requirements as a result of current systems and previously attempted developments, the DVA as an organisation cannot point to a documented list of user requirements which is a product of wide staff involvement and consultation. At best there exists an open ended list of broad hospital functions which the DVA conclude can be supported, in the main, by PCS modules acquired from overseas. However, the DVA cannot be fully assured that the individual features of any of these PCS modules match the as yet undocumented user requirements of any particular RGH function.

3.13 The Committee concludes that:

- the proposed integrated hospital management system is not based on a detailed analysis of the functional requirements of Repatriation General Hospital users but rather on the presumed analogous requirements of other users;
- the Department of Veterans' Affairs' strategy is modelled on the successful implementation strategy of a number of other hospital systems;
- the degree of success of the project will depend on the degree of compatibility between the real user requirements and the capabilities of overseas software;

- the greater the divergence between user requirements and software functionality the more expensive will be the cost of adding new functions as the number of functions already implemented increases; and
- the Patient Master Index is central to that implementation and that the data analysis consultancy currently underway should put the planning for the Repatriation General Hospital information system on a better footing.

3.14 The DVA has indicated that it has:

...already conducted a preliminary study with independent consultants on mapping the information flow, the data flow, in support of all seven of those [departmental] programs¹³

...a draft specification to go to an independent consultant now to look at the total data flows within the hospital¹⁴

Without functional analysis the DVA are in danger of simply choosing the 'best' PCS module available while failing to be cognisant of the shortfall between the PCS module capabilities and the actual needs of RGHs.

3.15 The Committee recommends that:

- the data analysis consultancy be concluded as soon as possible and its results be used to prepare a conceptual data base design for the total integrated hospital information system;
- an analysis of processing functions be carried out in addition to the data analysis study currently under way;
- it is highly desirable that this functional analysis be completed by the Department of Veterans' Affairs before it proceeds beyond the initial transfer of known Admissions, Discharges and Transfers functions to the new computing network; and
- the Department of Veterans' Affairs modify its project plans based on the understanding of its requirements once the data analysis and functional analysis are completed.

13. Joint Parliamentary Committee of Public Accounts, Proposed Computer Acquisition for Repatriation General Hospitals by Department of Veterans' Affairs, Minutes of Evidence, page 15.

14. Ibid., page 16.

Consultation with Staff

3.16 The Brand Report states that 'when questioned at the hospital level, staff emphatically stated they had not been consulted about the [PCS] decision. Further, the level of explanation to and therefore understanding of PCS by the hospitals is very low, and would not allow hospital staff to make an informed decision'.¹⁵ In consequence of its criticisms of DVA Central Office contact with hospital staff the Brand Report recommended 'that a Hospital Computing Steering Committee be set up in each RGH'.¹⁶ The DVA reported in Attachment A of its Submission that this has been completed.¹⁷ A further recommendation 'that a Hospital Information System Co-ordinator be appointed at each RGH' has also been implemented.¹⁸ The Brand Report also recommended 'that there be hospital representation at any Branch or Central Office Steering Committee'.¹⁹ The Repatriation Commission agreed with this recommendation and asked for a status report from the Chairman of the Central Office Steering Committee.

3.17 The Brand Report recommended 'that Central Office data processing staff become personally acquainted with the hospital environment and user requirements'.²⁰ The Commission agreed with the recommendation and requested that PCS team members should continue visits to RGHs. At the moment the reconstituted PCS Team is currently housed at Concord RGH so that team members' familiarisation with hospital requirements is facilitated.

3.18 Since June 1985 when the Brand Report was published the DVA has improved its consultation with staff. The Supplement indicates that²¹:

Hospital staff have been, and will continue to be, involved in this project. Contact with staff has been through:

- PCS Steering Committee;
- PCS Co-ordinators Group;
- continual liaison with test site management and staff;
- presentations and discussion by PCS team members in all States;
- initial PCS Team members recruited from RGH environment;

15. Appendix 4, page 305.

16. Appendix 4, page 307.

17. Appendix 1, page 120.

18. Appendix 4, page 307.

19. Appendix 4, page 307.

20. Appendix 4, page 307.

21. Appendix 3, page 185.

- RGH Concord conducting their own review meetings on the PCS Project instigated by their ADP Manager/PCS Co-ordinator;
- PCS Hospital & Medical Computing Bulletin;
- computer awareness courses run by PCS staff; and
- distribution of Minutes of the various meetings and comprehensive documentation to as wide an audience in B.O.s (Branch Offices) and RGHS as possible.

3.19 The DVA implementation plan calls for progressive implementation of functions and DVA is unwilling to build up the expectations of staff by too early discussion of future systems and their staff impacts.²² In the past the project has had a chequered history and staff morale in relation to ADP is very low.²³ In this environment the DVA has opted for a conservative first step in order to demonstrate success as soon as possible. The first step is the replacement of the current ADP system with its PCS equivalent. The staff involved with the current system are already computer-literate and this step should not pose major implementation difficulties. The Committee's visit to Concord indicated that staff in this area had been consulted adequately and that they felt that PCS would be implemented and were looking forward to the new system.

3.20 The DVA strategy calls for consultation with other staff as the functions with which they interact are scheduled for implementation and as the access to the ADP functions to be implemented first is extended throughout the hospital. Staff outside the ADP environment had no expectations of early access to automated facilities but seemed to be well aware of the potential from discussion with colleagues in other hospitals or from computer courses that they, particularly nurses, had attended.

3.21 The integrated hospital information system will be an on-line, real-time computer system depending heavily on the interaction of staff and hospital systems, and the suitability and acceptability of these systems to staff is crucial to project success. In addition the DVA strategy of progressive acquisition, development and implementation of software modules does not encourage early consultation with staff in all areas.

3.22 The Committee concludes that:

- extensive and ongoing consultation has taken place between Central Office staff and Concord Repatriation General Hospital senior medical managerial staff involved with the current Admissions, Discharges and Transfers system;

22. Appendix 3, page 288.

23. PCS Project Management, Chapter 3, page 25.

- consultation with other user staff has not been adequate in the period up to mid-1985 but that staff consultation for the Admissions, Discharges and Transfers functions has improved considerably in the period since; and
- the level of staff consultation for staff not scheduled to use automation in the near future is not adequate.

3.23 The Committee recommends that:

- the Department of Veterans' Affairs take steps to inform its staff of the strategy for implementation of its integrated hospital information systems, the benefits accruing from the degree of integration, and management commitment to the strategy; and
- the Department of Veterans' Affairs provide and update as early as possible details for implementation of individual hospital functions, including timings, to staff.

Consultation with Staff Associations

3.24 The Submission indicates that a Memorandum of Understanding between the DVA and staff associations was agreed in September 1985.²⁴ The purpose of the Memorandum is to set out jointly agreed arrangements for:

- consultation between Staff Associations and the Department regarding technological change within the Department;
- the principles which underline the agreement to consult; and
- describing the nature and timing of the flow of information between the Department and the staff associations involved in these arrangements.

3.25 The Supplement indicates that:

All staff associations with members in DVA hospitals have been kept informed of plans and progress at Federal Office level. Local representatives in hospitals have been involved in specifying required features of new systems in their area and of evaluating available products.

To date, evaluation has been confined to clerical staff looking at the replacement Admissions system and pathologists looking at a PCS system developed

24. Appendix 1, page 128.

by a private pathology bureau in Brisbane.

As the extension of access to systems such as Admissions into wards is considered, representatives of Nurses will become involved.²⁵

3.26 To date, the DVA have established the Memorandum of Understanding which will underpin the Department's ongoing consultation with staff associations and have commenced discussions with staff associations in relation to the first PCS implementation. No indication is available of consultation in relation to Outpatient Scheduling, the second implementation step.²⁶ Also no indication is given of consultation in relation to additional functions (Infection Control, Nurse Loadings) that the DVA are developing and which are planned to be added to and released with APMS for production late in 1986. Consultation appears to have commenced in relation to the implementation of a Pathology system to be implemented at a later date.

3.27 The Supplement states that:

A formal job impact study has not been done because the first module of PCS is intended to be merely a replacement of the current system. Job impact will be assessed during the trials and piloting of the software. ADT staff will be participating in those trials and contributing to the job impact study.

Staff Associations have been involved through the PCS Director's participation in the National Consultative Council meetings. It is intended that each planned application module will be subject to a discrete job impact study with only the relevant staff associations involved. This approach has been largely accepted by the various staff associations in the RGHs.

The PCS incremental applications approach does not lend itself to an overall job impact study as the process of systems implementation is continuous.²⁷

3.28 The Committee is disappointed that the Job Impact Statement for the ADT staff will not be prepared until after the hardware and initial software have been acquired. The costs to adjust the software if the Job Impact study identifies any difficulties could be considerable. The Committee believes that a Job Impact study should have been carried out at the time DVA provided specifications to IBM and commenced work on assisting IBM to design the software.

3.29 The Committee notes, however, that the first of the hospital functions to be implemented, the ADT function, is the best understood and is currently automated. In addition, from an inspection of RGH Concord current ADT system and an IBM demonstration of APMS at Royal Adelaide Hospital, the Committee

notes that both systems are on-line real-time systems with substantial overlapping functionality, that the interface APMS presents to the system user appears well designed, and that staff should not have great difficulty in converting from one to the other.

3.30 The Committee concludes that:

- the Department of Veterans' Affairs consultation with staff associations commenced after the Department decided to base its future integrated hospital information system on the Patient Care System, but that these consultations are still in a preliminary stage.

3.31 The Committee recommends that:

- the Department of Veterans' Affairs prepare a broad Job Impact Statement in conjunction with staff which addresses the impacts on staff numbers, duties, organisational arrangements and the work environment generally where manual systems are to be replaced by on-line, real-time computer systems and that this statement be widely circulated and discussed with relevant staff associations; and
- the Department of Veterans' Affairs prepare Job Impact Statements for each function to be implemented at the earliest possible time before the completion of the specification stage.

PCS Project Management

3.32 The PCS project team was first established in September 1984. By November 1984 the project team comprised 10 positions of which 8 were filled. In December of that year the highest ranked ADP officer resigned and when the project director resigned in May 1985, the project team staffing had reduced to 4 officers.

3.33 At this point in time the Brand Review was taking place. The Brand Report states²⁸:

Although the initial decision appears to have been taken in December, 1982, progress since then has been monumentally slow. In October, 1984 a PCS project team was assembled at RGH, Concord. The problems encountered by this team as a direct result of CO ADP failing to provide even the most basic resources have already led to a number of resignations from the PCS team, including that of the Director. The initial attempts to establish a PCS team seem to have failed. The Department must take steps to ensure that a future team does not fail.

28. Appendix 4, page 306.

25. Appendix 3, page 220.

26. Appendix 3, page 288.

27. Appendix 3, page 186.

If PCS is to succeed the services of a well qualified project manager with a demonstrated track record should be obtained from outside the Department. This person does not need to be medically qualified, but a medically qualified person is required as part of the team to ensure the quality of the system function and to protect the users' interest.

3.34 Following the Brand Report, the Disc Report stated²⁹:

After 7 years deferral, adequate funds, skills and a strong commitment are now required to ensure the successful implementation of the system.

A strong management structure must be established to control the project and conduct the development work.

3.35 The Disc Report also identified a number of project management issues³⁰:

- No systems development methodology had been utilised with the result that team members did not know which tasks to perform next to produce a complete set of documents for any specific phase of the project;
- A detailed project plan was not documented; and
- The PCS project team was severely under resourced. There was no budget for the PCS team.

3.36 The Committee requested at its hearings that the DVA provide documentation of the extent of knowledge of the Secretary's office on past problems with the PCS team. This information was supplied on 7 April 1986.

3.37 The Committee concludes that:

- from an analysis of Departmental documentation supplied and from the other independent consultants' reports, it is clear that in the period to May 1985:
 - the project did not have sufficient project management experience for a project of the nature and size of the Patient Care System project;

29. Disc International Pty Limited, Consultancy Review of Proposed PCS Package Implementation at Repatriation General Hospitals, Final Report, July 1985, pages 3,4.

30. Ibid., Appendix F.

- the project's working environment was characterised by personality conflicts and low morale;
- relationships between the Central Office and the project team had deteriorated;
- there was a lack of commitment to the Patient Care System team from Central Office due to its underestimation of the amount of modification needed for the Patient Care System to meet Repatriation General Hospital requirements;
- the Patient Care System was purchased without a proper study of requirements; and
- these factors were the major contribution to the project's failure.

3.38 In 1981/82 funds were provided for both the PCS package and a new computer to meet both PCS requirements and a extended National Computer Centre (NCC) workload. When subsequently the cost/benefit case for an installation of both PCS and NCC Computer was rejected, the DVA acquired an Amdahl computer for its NCC and purchased PCS in 1983/84. IBM would not provide support for PCS on an Amdahl computer. The project consequently was left to its own resources and uncertainties about the eventual hardware for PCS implementation resulted.

3.39 The Disc Report recommended the appointment of a long term full-time Project Director to act as the overall project administrator and to liaise with users and IBM at a management level. In addition, it recommended, the appointment of a PCS Project Leader with a strong IBM background, experienced in on-line data base systems.³¹

3.40 Following the Disc Report, the DVA seconded an Assistant Secretary from the Systems Division to the position of PCS - Project Director for a period of six months to put the project on a sounder footing. The team has progressively been built up although further losses occurred post May 1985. The staffing level with the exception of the Project Director and support staff is 7 with two positions currently advertised. The secondment of the Project Director has been extended. However this role is likely to revert to its normal part time involvement by the Assistant Secretary in Central Office when the currently advertised position of PCS Project Leader is filled and established.

3.41 The selection criteria for the PCS Project Leader position includes project leadership skills as essential and ADP and hospital skills as desirable. Careful selection is necessary to ensure the project team effectively carries out the onerous

31. Disc Report, op. cit., page 15.

tasks facing it. While the experience in the team in relation to PCS is only newly acquired in some cases, the project should be able to look to a period of relative stability in the terms of staffing.

3.42 The Committee concludes that:

- the Patient Care System project has been delayed for a considerable period of time as a result of poor decision making, misunderstandings and mismanagement;
- the Department of Veterans' Affairs has moved to correct these problems since early 1985 by the use of consultants and new staff appointments; and
- while the Department of Veterans' Affairs recovered some ground, much needs to be done before the infrastructure for the implementation of an integrated hospital information system is in place.

3.43 The Committee recommends that:

- the Patient Care System project be given a high priority in view of the effect on morale of Repatriation General Hospital staff if the project falters yet again; and
- the Department of Veterans' Affairs make maximum use of its already established committee structure to ensure that the Department's current commitment is translated into the necessary support and guidance to create a healthy project team environment for systems implementation.

Method of Acquisition

3.44 The DVA states in its Submission that:

It is intended to provide the RGHs with reliable and responsive computing services through the installation of a standard IBM-compatible computer at each mainland RGH to improve the quality of patient care.³²

3.45 At the hearing, the DVA advised that it saw the outcome as:

Firstly, approval of the proposal to acquire medium-scale IBM compatible computing facilities for installation in the five mainland RGHs; and, secondly, approval for the

32. Appendix 1, page 88.

acquisition of the first computer under Certificate of Exemption in favour of IBM and that computer to be installed at RGH Concord.³³

3.46 In the various documents supplied, the DVA has argued that all computers for RGHs should be IBM compatible. Arguments given include:

- The Department's extensive investment in IBM-based systems, operations experience and dependence on the NCC computer-held database of client information by [Departmental] Offices and the RGHs dictate that the proposed computing facilities for the hospitals must be IBM-compatible³⁴;
- Lack of in-depth computer operations experience in the RGHs, the need to capitalise on existing NCC expertise in IBM software and containing the growth of computer support staff in the RGHs determine that the Department must ...acquire similar IBM-compatible facilities for each Repatriation General Hospital³⁵; and
- the National Computer Centre will provide central support to the RGH computer installations with operations procedures and standards, operator assistance, network management and ongoing liaison with hardware and software suppliers.³⁶

3.47 It is normal practice for a department with an existing heavy investment in computer hardware of a particular type to seek to restrict its detailed analysis of a proposal for new or expanded hardware to hardware which is compatible with its existing hardware. Arguments given include those of the general nature put by the DVA, ie, the costs to the department of changing equipment types are substantial and incompatible with its strategic plans. In taking this course of action departments want to avoid the costly and time consuming open tendering process. They also argue that tenderers will also be saved unnecessary time, inconvenience and expense under such circumstances.

3.48 The question in the DVA's case for the restriction of tenders to IBM compatible suppliers is whether it would be likely that other manufacturers and software suppliers could supply a viable cost-competitive alternative. At the time that the DVA first decided to adopt PCS software as the vehicle for supporting its integrated hospital information system strategy, it had

33. Minutes of Evidence, op cit., page 12.

34. Appendix 1, page 89.

35. Appendix 1, page 90.

36. Appendix 1, page 90.

decided to upgrade its NCC facilities and support its RGH requirements from the central installation as it currently does. On the basis of IBM software experience an argument was accepted at that time that the RGH should be restricted to IBM compatible equipment. Hospital software of the kind the DVA wished to acquire was not available from alternative sources or was only in embryonic form compared with the PCS software.

3.49 In the event, the PCS proposal did not proceed and the Department acquired its current Amdahl computer. However in 1983/84, the DVA did purchase the US version of PCS on the basis that relatively minor modifications would be needed to make PCS suitable for Australian conditions. This project failed. The DVA stated at the hearing that:

The Department's attempt to develop a PCS patient management system in 1984/85 without the assistance of IBM was a failure.³⁷

3.50 The Committee has concluded from its review of relevant Departmental correspondence that project management, personnel problems and underestimation of the extent of modifications were the primary reasons for the project's failure.³⁸

3.51 At the time of taking the decision to acquire PCS in 1983/84, it is not clear whether the DVA canvassed software other than IBM - compatible software. While there are costs associated with linking different machines in a networking configuration and costs associated with replicated support staff, this does not necessarily mean that other software solutions would not be practicable or more attractive in a cost/benefit sense.

3.52 At this time there were, the Committee understands, two other integrated hospital information systems available in Australia, both on non IBM-compatible equipment. Particularly in the light of the difficulties the DVA have subsequently experienced with the PCS project, a thorough evaluation of these alternatives should have been undertaken before the DVA decided to purchase PCS.

3.53 The Committee understands that the Burroughs system MEDILINC supports admissions and discharges, and hospital billing functions. While it is at least comparable with the core PCS modules it does not as yet appear to have the full range of functions potentially available from overseas PCS software.

3.54 The McDonnell Douglas system, THIS, appears to have an extensive range of software beyond the core PCS software but would appear to have less than the total PCS offering. Of course, THIS already exists and is being successfully used in Australian hospitals. The PCS range of software can only be utilised by the DVA after some modification. The PCS overheads are relatively

37. Minutes of Evidence, op cit., page 10.

38. Matters Arising from the Brand Report, Chapter 3, page 26.

high leading to statements that it performs cost effectively for hospitals over 250 beds in size. The McDonnell Douglas system would not appear to have penetrated significantly into the larger hospital market.

3.55 At the Committee's hearing, the representative of DOLGAS indicated:

...we do support its (DVA's) case for IBM compatibility. That is based on the fact that the Department of Veterans' Affairs has in fact a very large investment in IBM software and associated systems.³⁹

Conclusion

3.56 The Committee concludes that:

- for the Department of Veterans' Affairs' purposes the alternative, non IBM-compatible, integrated hospital information systems do not offer advantages over the Patient Care System;
- the Patient Care System appears to be the only suitable system for the Department of Veterans' Affairs in the IBM-compatible market; and
- any tendering process should be restricted to the IBM-compatible market. It notes that the Department of Local Government and Administrative Services is in agreement with this view.

3.57 In arguing for a Certificate of Exemption in favour of IBM for the Concord RGH computer the DVA have stated:

Vendor support from IBM is required. DVA must ensure its interests are protected and that DVA staff have adequate involvement in any area IBM takes responsibility for...⁴⁰

The Department believes that IBM is unable to guarantee applications and technical support other than normal software service to PCS users who do not operate IBM computing facilities. In view of that position and of:

- the emerging DVA commitment to PCS in six Repatriation Hospitals;
- the developing competition for IBM support services as the PCS product is adopted by a number of State authorities;
- the real risk to the achievement of project benefits without responsive IBM support;

39. Minutes of Evidence, op cit., page 43.

40. Appendix 4, page 306.

- lack of information interchange with IBM system users (membership of the SHARE/GUIDE IBM users group and the PCS users group is offered only to users of IBM-supplied computers); and
- an estimated hospital computing program cost of \$20.5m over five years;

the Department suggests that any marginal [additional] cost of acquiring a single IBM computer over the cost of a competitive machine is more than outweighed by the value of the expert support and information that would become available.⁴¹

Risks and costs associated with the use of complex operating system software on the planned seven IBM-compatible computers in the DVA network (a second processor for the NCC is proposed for 1985/86) would be inevitably reduced if at least one of those computers was supplied by IBM.⁴²

3.58 At the time the Brand Committee was finalising its report, the DVA's PCS project was in difficulties. The PCS package had been obtained, attempts to modify it for Australian conditions had proven more costly than anticipated, and the PCS team was in a state of some disarray. The IBM health market strategy for supplying hospital information systems had emerged. In this environment the Brand Report indicated that IBM support was required. The Committee feels that this recommendation may have been a reaction to the circumstances of that time.

3.59 The Committee understands from discussions with IBM that IBM is not able to provide support other than normal software services to PCS users who do not operate IBM computer facilities. IBM have indicated to the Committee that it provides marketing activity at the discretion of the IBM Branch Manager to assist its customers to acquire, install and use IBM products and services. Application development and maintenance are generally considered a major cost item in a data processing budget. By applying its technical support resources to these tasks, IBM could help DVA achieve optimal productivity.

3.60 However, IBM further states that consistent with these objectives, IBM does not quantify or contract its marketing activities. It endeavours to manage the availability of its staff to best meet the real support needs of its customers and to maximise the professional development of its people.

3.61 While IBM may provide additional support to users, it would appear to be at the discretion of IBM as to whether, in what form and when this support takes place. As the customer base for PCS expands it may be that the DVA will be in competition for

41. Appendix 1, pages 92,93.
42. Appendix 1, page 94.

scarce IBM support resources on which they may not always be able to rely or over which they may not have appropriate control.

3.62 On the basis of the DVA's current commitment to PCS already decided, it would appear that the case for a Certificate of Exemption in favour of IBM rests on the degree of dependency the DVA must of necessity have on IBM support for PCS. The DVA have indicated that its PCS project failed because it did not involve the necessary degree of IBM support. The Committee concludes that a number of other factors played a significant role in that failure.⁴³

3.63 In Answers to Supplementary Questions, the DVA claim:

DVA expects a high level of support from IBM in establishing the RGH Concord computer and in successfully implementing the Patient Care System. It is expected that the initial support will be at no cost, in accord with formal and informal offers already extended to the Department by IBM.⁴⁴

3.64 The Supplement to the DVA Submission states⁴⁵:

it is estimated that if IBM support is not available to the PCS project, additional resources would be required as follows:

- six additional systems staff;
- four staff years of systems engineering support during 1986-88; and
- \$300,000 p.a. for overseas consultants and overseas assignment of DVA staff.

The opportunity exist for DVA to participate in joint development activities with IBM through a formal agreement. Ongoing support from IBM for PCS development and operations at RGH Concord, at little or no cost, will be sought in negotiations.

3.65 In the Answers to Supplementary Questions it states:

The costs of support to PCS and computer operations for other RGHs will be a factor in the open tendering for the computing facilities at those hospitals.⁴⁶

43. Matters Arising from the Brand Report, Chapter 3, page 27.
44. Minutes of Evidence, op cit., page 90.

45. Ibid., page 90.
46. Ibid., page 90.

3.66 The PCS software is written in a fourth-generation software language called PCS/Applications Development System (ADS). The DVA claim that, using this software, a threefold productivity gain in development terms is achieved compared with using COBOL and that software obtained from overseas is easily modified for individual hospital purposes. The Royal Adelaide Hospital (RAH) used PCS/ADS to modify the USA version of PCS for its own use satisfactorily and have been using this modified software for some time. However it should be noted that RAH did not achieve a software solution that allowed the integration of their product with other overseas software.⁴⁷ Nonetheless, the RAH experience indicates that with modest programming staffing levels, it is possible to modify the software without IBM assistance.

3.67 The Committee recognises that establishing the core PCS module is closely aligned with the establishment of the PMI data base and a software environment supporting interactive user access and that this can be a difficult task for a user who seeks to modify the PCS core module as RAH has done. It is expected that with the implementation of subsequent modules, these problems will be less. Once the DVA have acquired APMS from IBM it should more easily be able to acquire overseas software and modify it for their purposes using PCS/ADS.

3.68 At the hearing, the DVA indicated that DVA⁴⁸:

...have a fair amount of training, experience and understanding of the PCS product through our junior partner role with it [IBM] in the development of the core module.

While the DVA might have once been inexperienced with PCS software, they now have hands on experience of some two years with the USA version of PCS and have contributed to the development of the Australian version APMS.

3.69 If the DVA were not able to use the fourth-generation PCS/ADS to carry out, on their own behalf, modification to overseas software, then it should be possible to obtain support from sources other than IBM. Firstly, there is a growing body of expertise in Australia in the PCS from which DVA could acquire the necessary skills. There is a large amount of expertise in the USA that the DVA could perhaps utilise on a consultancy basis. In addition, in an IBM-compatible tendering arrangement, a supplier of IBM-compatible equipment may be prepared to acquire the necessary expertise to support a user like the DVA. The Committee has no explicit evidence to indicate that these options are or are not possible but it is aware of the claims that fourth-generation languages place in the hands of the users the ability to easily generate and amend software for their own purposes. It is also aware that many USA hospitals have developed additional hospital software with modest staffing levels using PCS/ADS.

47. Minutes of Evidence, op cit., page 32.
48. Ibid., page 49.

3.70 The Electronic Computing Health Oriented User Group (ECHO) is a group of PCS users. It is open to any employee of any hospital or health related facility having IBM systems installed or on order. ECHO continues to contribute to the advancement of electronic data processing in the health field through the interchange of ideas and information. If the DVA were not to acquire an IBM machine then it would be denied this valuable contact with PCS users. On the other hand the DVA is already aware of the major suppliers of PCS software in the USA and can proceed to acquire software independently of IBM or ECHO.

3.71 The Committee is aware of a number of health agencies that have relied heavily on vendor support for software implementation and support. A number have argued that it is financially more attractive to pay for this support rather than to develop the expertise required in-house. The Committee understands that economies of scale make this arrangement more attractive for smaller hospitals and less attractive for larger hospitals, although some larger hospitals have also relied heavily on vendor support. It is also the case that a number of hospitals have relied on vendor support initially and then taken responsibility for further development themselves.

3.72 The Committee is aware that the DVA has devoted development staff to the joint development of APMS and so far have only received the benefit of the educational experience. The payments from IBM for these services have gone to consolidated revenues. As such the DVA have foregone the opportunity benefits associated with their staff working on the joint development. The DVA will obtain part of its expected benefits only if an IBM machine is acquired.

3.73 The Committee is aware that almost all of the 250 hospitals throughout the world using IBM's PCS software have IBM computers installed. The Committee expressed its concern at the hearing that in choosing PCS as the vehicle for its integrated hospital information system, the DVA had locked itself into a Certificate of Exemption to purchase IBM hardware. The representatives of the DOLGAS and Department of Finance were asked:

What is your attitude to decisions with relatively small direct funding implications, that is, to buy this software PCS product, subsequently providing the grounds for a Certificate of Exemption for a major hardware acquisition?

3.74 The DOLGAS representative replied:

We see this as a difficulty for the Commonwealth in terms of trying to maintain a competitive position and in maintaining a reasonable negotiating position with vendors.⁴⁹

49. Minutes of Evidence, op cit., page 40.

We see that it [the case for a Certificate of Exemption] would have to be argued on grounds which are publicly defensible⁵⁰

We have to have regard, as do all departments, to the Finance Regulations which say that there should be equal opportunity for all to participate in government business and that the most fair method to do that is in fact through the public tendering system.⁵¹

3.75 The Department of Finance representative at the hearing indicated that his department would wish to know, before such a software package was acquired, what the downstream implications were.⁵²

3.76 Later, in a written reply to the Committee, the Department of Finance indicated that most proposed software package acquisitions would not be submitted individually for Finance scrutiny and approval and that the Department does not have control over the software products that a department initially intends to acquire or subsequently actually acquires.⁵³ The Department of Finance also stated that the Department does not consider that the acquisition of a software product would, per se, provide the grounds either for a major hardware acquisition or for a Certificate of Exemption (C of E) for a particular hardware acquisition.⁵⁴

3.77 In relation to the specific DVA case the Department of Finance representative at the hearing indicated at the time funding was sought for PCS it was understood that IBM compatible equipment, rather than IBM equipment, was required to operate the product.⁵⁵

3.78 In April 1982, the DVA sought funds for PCS and informed the Department of Finance that:

...the tenderers for the hardware had given assurances that their equipment would be able to use PCS and motivation among the tenderers was such that all could make adjustments to accommodate PCS⁵⁶

3.79 In August/September 1982, approval was given to rent an Amdahl V/8 but procurement of supplier programming support for PCS was not recommended by DVA because of excessive cost.⁵⁷

50. Minutes of Evidence, op cit., page 40.

51. Ibid., page 45.

52. Ibid., page 43.

53. Ibid., page 74.

54. Ibid., page 75.

55. Ibid., page 41.

56. Ibid., page 77.

57. Ibid., page 76.

Conclusion

3.80 The Committee concludes that:

- at the time of purchase of the Patient Care System, the Department of Veterans' Affairs did not recognise the implications of its software acquisition; but
- earlier mismanagement of the Patient Care System project and underestimation of the nature and size of the project have played a role in the Department's decision to seek a Certificate of Exemption for the Concord Repatriation General Hospital computer.

Recommendation

3.81 The Committee recommends that:

- Departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine ADP Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications.

Conclusion

3.82 The Committee concludes that:

- a case exists for the the Department of Veterans' Affairs to call tenders for IBM-compatible equipment, and the acquisition and support for the Australian Patient Management System to determine the level of support for the Patient Care System in the market place;
- there may be a case for the granting of a Certificate of Exemption in favour of IBM for the Concord Repatriation General Hospital computer based on the special level of support for the Patient Care System that the Department of Veterans' Affairs claim they require from IBM; and

- the decision on the method of acquisition properly rests with the Department of Local Government and Administrative Services.

3.83 The Committee considers if a Certificate of Exemption were to be granted for an IBM computer for RGH Concord the nature of the contractual arrangements would require some analysis. If a contract for hardware alone or hardware and the supply of APMS were to be entered into, the Commonwealth would not be in a strong negotiating position. If a supply and development contract were to be considered then the Commonwealth would have some negotiation power in terms of the level and nature of the support it is to subsequently receive, its cost and software costs.

Recommendation

3.84 The Committee recommends that:

- should the Department of Local Government and Administrative Services accept the arguments put to it by the Department of Veterans' Affairs for a Certificate of Exemption for an IBM computer for Repatriation General Hospital Concord, a supply and development contract should be concurrently negotiated with IBM which ties further development and support for the Patient Care System related software to the initial IBM computer acquisition.

3.85 The DVA signed a memorandum of understanding with IBM dealing with the DVA's involvement in a joint development with IBM and Royal Adelaide Hospital. The memorandum called for developmental support from the DVA (mainly in the area of specification of requirements and program design) for which IBM would pay commercial hourly rates at agreed levels. The gains to the DVA would involve influence over the functional specifications, early access to products, minimisation of the cost of software development, assistance from IBM in implementation activities and valuable experience with the software. The gains to IBM would be availability of hospital defined specifications, marketable products and a reference site for installed applications.⁵⁸

3.86 A number of questions arise from this arrangement. While the Commonwealth has been paid for its services, IBM have gained a product with significant marketing potential. The Committee would be interested to determine whether the value of the DVA input of hospital systems expertise towards this development has been adequately recompensed and to what extent the benefits of cost minimisation of software development and assistance with implementation activities are legally enforceable. It should also be determined whether the Commonwealth becomes responsible in any way for the product having been involved in its development. Finally, the Committee has doubts as to whether the DVA should have entered into a joint development arrangement

whereby some of the expected benefits would only accrue if the Department were able to acquire an IBM computer, and to have entered this arrangement prior to being assured of its method of acquisition.

Recommendation

3.87 The Committee recommends that:

- the Department of Local Government and Administrative Services investigates:
 - the legal aspects of the memorandum of understanding between IBM and the Department of Veterans' Affairs; and
 - whether the Department of Veterans' Affairs should have entered into such arrangements prior to gaining approval to proceed with the chosen method of acquisition.

3.88 At the hearing, the DVA indicated they were seeking the earliest possible report from the Committee regarding the above to enable the Department to commit funds to site preparation at Concord in 1985/86.⁵⁹ The Committee asked the DVA at the hearing:

Having in mind that there has been a long period of development of this project ... Why is it imperative to purchase and commit funds in 1985/86?⁶⁰

3.89 The DVA responded that it was concerned about the loss of staff. The process of recruiting staff in the Public Service is such that four months is probably a good time to achieve recruitment from an advertisement through to actually getting somebody on board, and six months is more than likely. The PCS team is now back at strength again. The danger is that they will be lost because the PCS development is gaining momentum in Australia and there will be a demand for people with the skills in that field.⁶¹

3.90 It was established at the hearing by DOLGAS that it would not be basing the urgency (leading to a Certificate of Exemption) on the need to expend the funds in this (1985/86) financial year.⁶² The Department of Finance indicated that it would not view very favourably the decision to be taken just for the purpose of spending funds within a particular year.⁶³

59. Minutes of Evidence, op cit., page 12.

60. Ibid., page 47.

61. Ibid., page 49.

62. Ibid., page 51.

63. Ibid., page 53.

58. Minutes of Evidence, op cit., page 108.

3.91 In relation to timing a contract let through an open tendering arrangement is more likely to coincide closely with completion of the site works at Concord. As has been indicated above, if a C of E is issued, doubts still exist about the length of time it would take to negotiate with IBM and have a supply and development contract ratified by the Attorney-General's Department.

3.92 The Department of Finance has indicated that, given that the DVA still wants the Department of Housing and Construction's IBM 3033 computer for the purpose of developing PCS, it is not clear why DHC's computer could not continue to be used at least until the Concord site has been prepared rather than acquiring a new computer through a of C of E that would then have to be accommodated by the supplier until it could be installed at Concord.⁶⁴

3.93 In relation to the loss of staff during this period it should be noted that productive use of the Concord RGH computer was scheduled for October 1986. With the delays foreshadowed it is likely that productive use will occur in January or February 1987, a delay of 4 months. It is possible that staff expectations of a C of E being issued and early acquisition of a computer being effected are such that these delays might result in some loss of morale. On the other hand, progress on the PCS project is being made, at last, even if not as fast as was hoped for by the Department. In the interim period there will be no shortage of productive work available to staff on the PCS team. Currently, the team is not fully formed and some members lack PCS experience. The additional period will allow higher levels of expertise to be acquired prior to productive use of APMS. The PCS team still has to produce its add-on functions to enhance APMS to the level of functionality of the ADT system.

3.94 Also, the Committee has made a number of recommendations for activity by the PCS team that would now be able to be carried out without jeopardising the realistic production date.⁶⁵

Conclusion

3.95 The Committee concludes that:

- no arguments exist for the Department of Veterans' Affairs restricting or avoiding public tendering in order that available funds be expended in 1985/86.

Recommendation

3.96 The Committee recommends that:

- the acquisition proceed expeditiously commensurate with proper tendering practices.

64. Minutes of Evidence, op cit., page 80.

65. Matters Arising from the Brand Report, Chapter 3, pages 20, 23, 25 and 28.

Costs/Benefits

3.97 Cost/benefit projections by Disc International have been accepted by the Department as support for this hospital computing proposal. The cost/benefit data contained in the various DVA documents convey a confusing picture. The Committee's conclusions about the cost/benefit of the proposal are therefore necessarily qualified because of these apparent inconsistencies in the cost/benefit information provided to it.

3.98 The Committee concludes that:

- the cost/benefit analysis carried out by the Department of Veterans' Affairs for this project is deficient in the following general respects:
 - the Department of Veterans' Affairs has not presented its project costing data in a comprehensive and consistent manner thereby making it difficult for the Committee to reach confident conclusions about the total costs and the benefits of the proposal;
 - discrepancies exist in the cost estimates and some costs appear to have been omitted;
 - the estimated benefits appear to be conservative and were not determined for the full range of software expected to be acquired or developed;
 - other unquantified benefits will accrue to the proposal; and
 - intangible benefits, such as better health care and patient convenience, will also accrue to the project.

3.99 The Committee has prepared Appendix 5 which presents its view of the costing information assembled in a compatible form. This costing information has been assembled from the following sources:

- New Policy Proposal, February 1985;⁶⁶
- Disc Report, Appendix D, Cost Projections;⁶⁷
- Amended New Policy Proposal, August 1985.⁶⁸
- Minutes of Evidence, page 55; and
- Minutes of Evidence, document tabled relating to costs entitled 'Costs of Proposal 1985/86 - 1988/89'.⁶⁹

66. Appendix 3, page 227.

67. Appendix 6, page 316.

68. Appendix 3, page 229.

69. Minute of Evidence, op. cit., page 71.

3.100 The following discussion draws together costing details from the above sources. The NPP figures relate to the four year period 1985/86 to 1988/89. The Disc Report figures relate to the five year period 1985/86 to 1989/90. Ongoing costs after initial expenditures are referred to and relate to the period 1986/87 to 1989/90.

3.101 The Submission states that the acquisition cost over four years of hardware, operating software and site preparation is estimated at \$10m of which \$2.6m is expected to be incurred in 1985/86 for purchase and installation of RGH Concord.⁷⁰

3.102 The January 1985 New Policy Proposal (NPP) indicated a 4 year cost of \$9.8m for hardware, site preparation, and software licences and maintenance services for the first financial year of implementation for each RGH. The Disc Report in July 1985 indicated a lesser figure of \$9.05m. The August 1985 amendment to the NPP allowed a 10% increase to take account of exchange rate movements since December 1984 and this cost was then estimated at \$10.53m.

3.103 Ongoing software licences and maintenance services costs were supplied to the Department of Finance in March 1985 to supplement the costs covered by the NPP and were estimated at \$4.9m over the three years 1986/87 - 1988/89. The Disc Report estimated these costs at \$3.885m for the three year period and \$5.885m for the five year period of the cost/benefit analysis. Once again the Disc Report concluded a lesser figure. The amended NPP estimate was \$4.07m for the three year period, somewhat less than the March 1985 estimate and greater than the Disc figure of \$3.885m for the three year period 1986/87 - 1988/89.

3.104 The combined hardware, site preparation and initial and ongoing software licences and maintenance services costs were estimated for the four year period 1985/86 - 1988/89 as \$14.7m, \$12.935m and \$14.6m for the January 1985 NPP, July 1985 Disc Report and August 1985 amended NPP respectively.

3.105 The January 1985 NPP estimates included RGH operations staff and NCC specialist support staff costs of \$1.3m over the four year period. The Disc Report estimate was \$2.4m over the four year period and \$3.25m over the five year period. The increase reflected the consultant's opinion that the RGH operational staffing numbers should be increased. At the hearing, the DVA indicated a figure of \$11m for staff costs based on the detailed staffing numbers in Appendix 10 of the Supplement covering RGH operational staff costs and the PCS team staff costs. These would not appear to cover the NCC specialist staff costs.⁷¹ The NCC specialist staff costs were estimated to be \$0.7m and \$0.4m in the January 1985 NPP estimates and the Disc Report respectively.

70. Appendix 1, page 88.

71. Minutes of Evidence, op.cit., page 71.

3.106 Increments to facilities at Concord and Heidelberg RGHs are planned in the four year period. The January 1985 NPP estimates \$1.0m for this purpose in 1986/87 and 1987/88. No estimates for upgrades are mentioned in the information supplied at the hearing. The DVA indicated in their Answers to Supplementary Questions that part of the hardware required was for communication links from Concord RGH to Heidelberg and Greenslopes RGHs.⁷² DVA state that this requirement is now not likely to be worthwhile. The other part of the hardware requirement was for expansion to RGH Concord computer memory and disc storage to take account of increased processing loads, now planned for 1988/89. The cost of this modified upgrade was not supplied in the Answers to Supplementary Questions. Some figure less than the \$1.35 million estimated in the Disc Report for hardware upgrades and communication links will be required in 1988/89 and should be added into the estimates provided at the hearing.

3.107 The question of the rate of acquisition of terminals and accounting for their costs remains unclear. The rate of acquisition of terminals will depend on the rate of implementation of hospital software modules and the rate to which access to software modules is extended throughout the hospitals.

3.108 Tables 2.1 and 2.2 of Appendix 2 of the Supplement give no indication of the number of terminals included in hardware costs. The Disc Report indicates that its cost assumptions are based on 50 terminals per site expanding to an average of 200 terminals each within 5 years.⁷³ The only place in the Disc Report that terminal costs are mentioned is in the initial hardware acquisition, the only hardware acquisition included apart from the non-terminal upgrades for Concord and Heidelberg RGHs.⁷⁴ Appendix 2 of the Supplement details the hardware acquisition for RGH Concord in 1985/86 and amounts to \$1.866m. This estimate is in agreement with the \$1.9m in Table 2.2. The terminals allowed for in this Table comprise 15 Colour Display Units and 5 printers. This falls short of the 50 terminals indicated by the Disc Report as the initial acquisition.

3.109 The numbers of VDU terminals to be initially acquired as given in the Answers to Supplementary Questions are⁷⁵:

RGH Concord	57
RGH Heidelberg	40
RGH Greenslopes	35
RGH Hollywood	20
RGH Daw Park	20
RGH Hobart	10

3.110 One terminal printer will be required on average for every 4 VDU's.⁷⁶

72. Minutes of Evidence, op.cit., page 85.

73. Disc Report, op. cit., page 23.

74. Appendix 6, page 316.

75. Minutes of Evidence, op.cit., page 86.

76. Ibid., page 86.

3.111 The Answers to Supplementary Questions indicate that RGH Concord may in the long term have installed 300 terminals.⁷⁷ It is expected that the terminal acquisition for Concord RGH will be no greater than 200 terminals at the end of the 5 year period.

3.112 The Answers to Supplementary Questions state that Disc International reviewed a very limited number of potential PCS applications in the RGHs that could be implemented in a 5 year period, including Admission and Discharges, Appointment Scheduling and Orders Entry/Result Reporting.⁷⁸ The Committee understands that in the case of the RGH Concord the PCS applications implemented after the 5 year period will generate the additional access needs to be supported by the 100 additional terminals.

3.113 It is envisaged that the staffing of PCS will be progressively reduced from 8 to nil over a four year period. Given the DVA plan to acquire overseas software progressively for implementation after the necessary DVA amendments are applied, the Committee envisages the PCS team will have a longer life and a slower run down of staff numbers. The Committee notes that in Appendix 10 of the Supplement that a run down in PCS team staffing numbers does not occur.⁷⁹ The Department of Veterans' Affairs has indicated in their Answers to Supplementary Questions that the Disc cost/benefit study analysed costs and benefits for only the limited applications and that the staff fall off reflects the team's work on those applications.⁸⁰

3.114 The Committee therefore found that the PCS team will need to be maintained at its proposed full strength for a number of years while further implementation of hospital software modules which have not been addressed in the cost/benefit analysis proceed.

3.115 The Committee assumes the appropriate costs are represented by the costs supplied at the hearing for the period 1985/86 - 1988/89 augmented for the fifth year covered by the Disc Report benefits statements and adjusted as indicated in the analysis above.

3.116 The recent IBM announcement of new models in the 4381 range of computers with improved price/performance characteristics may lead to lower costs for initial hardware acquisition for RGHs or to an increased period of use prior to RGHs needing to upgrade the initial hardware acquisition. Any reduction in costs is dependant on the method of acquisition and market reaction of other hardware vendors.

3.117 The Committee found that:

- the PCS project costs for the period 1985/86 - 1989/90 are conservatively estimated at the level of \$25.6m indicated at the public hearing;

77. Minutes of Evidence, op.cit., page 86.

78. Ibid, page 87.

79. Appendix 3, page 300.

80. Minutes of Evidence, op.cit., page 88.

- the \$25.6m should be augmented by an unknown but significant amount to cover the full initial acquisition of terminals and the ongoing acquisition of terminals, and by an amount less than \$1.35m for upgrade to the Concord and Heidelberg RGHs in 1988/89;
- the \$25.6m should be augmented to accommodate the fifth year of the Disc cost/benefit analysis;
- the \$25.6m should also be augmented by an amount in the vicinity of \$0.07m to cover NCC specialist staff costs; and
- the \$25.6m should be decreased by an amount commensurate with the costs included for PCS team staff who will be utilised in the five year period on software development not included in the Disc Report cost/benefit study.

3.118 In order to assess the benefits from PCS implementation in hospitals, Disc International designed a questionnaire and conducted a Benefits Survey in each RGH. Disc International indicated to RGHs that⁸¹:

...it is clear that the full benefits of an integrated PCS implementation will only be attainable long-term, however, the prerequisite stage referred to as [APMS has a high 'start-up' cost. It is therefore important to quantify benefits based upon long-term operational gains, say over five years.

It is difficult to rationalise a general statement of benefits as different hospitals handle different types of patients and therefore have widely differing ranges of medical facilities, number of beds, internal communication loads etc. Similarly, the management of different hospitals have widely differing priorities. One hospital may for instance, have a desire to increase its bed utilisation, another may want to reduce the administrative workload of the professional staff, and a third may want to improve general fiscal control.

Therefore, the emphasis must be directed towards the long-term assessment of financial benefits which may be expected from the application of a PCS system in each RGH. Estimates are needed from this survey to project quantifiable benefits rather than to determine patient care

81. Disc Report, op.cit., Appendix B.

improvements, although, it is documented that significant improvements in patient care have been a prime achievement of hospitals installing the package.

3.119 In view of the lack of experience of RGHs with integrated hospital information systems and PCS in particular, the questionnaire included examples of savings attained by overseas hospitals to guide RGH staff in arriving at their conclusions. In some cases expected savings by Concord RGH were quoted.

3.120 Each RGH was asked by the Department of Veterans' Affairs to quantify benefits likely to be achieved against a range of 'benefit points', including⁸²:

- reduction in length of stay;
- reduced workload for nursing station/clerical staff;
- automatic printing of drug selection instructions;
- order status enquiry;
- wastage of consumables;
- improved scheduling; and
- management opportunity.

3.121 In the Answers to Supplementary Questions the DVA indicated that the above benefits are those expected from the implementation of Admissions and Discharges, Appointment Scheduling and Orders Entry/Reporting.⁸³

3.122 The results of the Benefits Survey were presented in the Disc Report, Table 2, which is reproduced at Appendix 7. In general, RGHs have suggested lower benefits, in some cases significantly lower, than claimed for overseas hospitals.

3.123 Analysis of the RGH responses to the questionnaire in Appendix C of the Disc Report indicates the most significant gains generally will come from more efficient scheduling of hospital services. The differences between benefits claimed by RGHs vary considerably. Heidelberg RGH claim only one fifth of the proportional gains claimed by Concord RGH. In the area of Order Status Enquiries, Concord RGH claim significantly greater benefits than other RGHs.

82. Disc Report, op.cit., Appendix B.

83. Minutes of Evidence, op.cit., page 87.

3.124 The Committee found that:

- from an analysis of the responses to the questionnaire and the Repatriation General Hospitals' lack of complete understanding of Patient Care System, Repatriation General Hospitals tended to be conservative in estimating the gains from Patient Care System;
- the potential for cost savings due to efficient scheduling of hospital facilities and early conduct of tests ordered is significant; and
- it is likely that other Repatriation General Hospitals claiming significantly less benefits than Concord Repatriation General Hospital may achieve greater benefits.

Conclusion

3.125 The Committee concludes that:

- there is a lack of complete understanding of the Patient Care System on the part of the majority of Repatriation General Hospitals.

Recommendation

3.126 The Committee recommends that:

- the Department of Veterans' Affairs take steps to maximise the gains resulting from the implementation of the Patient Care System at other Repatriation General Hospitals; and
- the Department of Veterans' Affairs make the experience, expertise and information gained at Concord readily available to other Repatriation General Hospitals.

3.127 In addition, a number of entries in Table 2 of the Disc Report indicate an expectation of savings but the RGH concerned was unable to quantify the savings.⁸⁴

3.128 The Committee found that:

- within the scope of the cost/benefit analysis carried out:
 - costs are overstated somewhat due to communications equipment originally costed but not now required;

84. Appendix 7, page 323.

- costs of terminals are significantly understated;
- costs of PCS staff are overstated in relation to the scope of the cost/benefit analysis;
- costs of NCC specialist staff support are omitted from the final DVA costs statement;
- within the scope of the cost/benefit carried out:
 - DVA can expect annual benefits over and above the \$11.8m claimed in Table 2 of the Disc Report for the 5 year period 1985/86 to 1989/90;
 - qualitative benefits will accrue in the form of improved health care and less inconvenience for returns;
- additional benefits beyond the scope of the cost/benefit carried out will accrue in that:
 - additional PCS modules will be implemented in the 5 year period 1985/86 to 1989/90; and
 - the benefits obtained from the initial systems will continue to accrue beyond 1989/90 without necessarily incurring further hardware costs.

3.129 The results of the cost/benefit analysis carried out by Disc International is reported in Appendix 7 and consists of:

- costs \$20.5m;
- benefits \$37.1m; and
- benefit/cost ratio 1:1.81.

3.130 In the Answers to Supplementary Questions the DVA indicated that the benefits should have read \$36m leading to a benefit/cost ratio of 1:1.76.⁸⁶ On the five year basis of the Disc International analysis, the costs should be increased leading to a lower ratio. However, the ratio is increased, if other initiatives in the five year period that Disc International did not consider, are included.

85. Minutes of Evidence, op.cit., page 85.

Recommendation

3.131 The Committee recommends that:

- the Department of Veterans' Affairs institute a cost monitoring and control system such that accurate, timely and comprehensive project costing information is readily available to the Department of Veterans' Affairs management and external regulatory authorities; and
- the Department of Veterans' Affairs report to the Department of Finance its revised estimates of the Patient Care System project cost and benefits, any subsequent change in direction of the Patient Care System project and any increase in costs or additional costs to be incurred under the auspices of this project.

Estimation of CPU Capacity Requirements

3.132 The DVA Submission gives no direct indication of the justification for the mainframe Central Processing Unit (CPU) capacity required for the RGHs other than that the DVA require facilities equivalent to the IBM 4381 computer range so that the MVS/XA operating software can be installed throughout the network.⁸⁶ The Committee understands that the Department of Veterans' Affairs wish also to introduce the MVS/XA operating system on its mainframe computers in the National Computer Centre, and to standardise on MVS/XA throughout its network including the RGH machines. The Committee also understands that the smallest IBM machines capable of running MVS/XA is the 4381 series.

3.133 In response to Committee enquiries about the basis for RGH mainframe capacity estimates, the DVA advised in the Supplement that⁸⁷:

No CPU Chart is available. The number and variety of potential PCS application modules make the derivation of a comprehensive chart difficult.

The Department is guided in its IBM 4381-type selection by the experience of RAH [Royal Adelaide Hospital], the advice of IBM, and the overseas experience outlined at Appendix 6 [of the Supplement].

3.134 In the Supplement the Department of Veterans' Affairs advise that Royal Adelaide Hospital (a one thousand bed hospital) has installed a 4381 Model Group 1 computer. The Concord RGH is quoted as being a 725 bed hospital in Table 1 of the Disc Report.⁸⁸

86. Appendix 1, page 90.

87. Appendix 3, page 220.

88. Appendix 3, page 222.

3.135

The Supplement also states⁸⁹:

The University of Iowa hospitals has about 20 PCS modules supporting 3,500 users on its production IBM 3081-D mainframe computer. RGH Concord has 2,500 staff of whom approximately 1,000 could be considered eventual PCS users. A 3081-D is rated at 10 [million instructions per second] mips. As a guideline, Concord would need approximately... 2.85 mips to support a similar number of modules.

The [4381 Model Group 2] ...is rated at approximately 3 mips and is upgradable to a Model 3 rated at approximately 4.5 mips. Concord is unlikely to have 20 PCS modules developed within 5 years so, even allowing for operating system overheads, the 4381 range is considered suitable for the expected medium/long term development path.

3.136 In a report from an overseas visit the DVA indicate that the University of Iowa which is a 953 bed hospital with a staff of 6690, has two 3081K mainframes.⁹⁰

3.137 The Supplement further states that⁹¹:

Stony Brook Hospital N.Y. is probably the most computerised hospital in the world. It was opened in 1980 and computer technology introduced and extended as an essential tool for the conduct of an efficient business and the achievement of maximum cost avoidance.

Over one hundred applications have been installed in five years. These are based on IBM's PCS/ADS and embrace the functions of:

- Admissions, Discharges and Transfers;
- Nursing Station Support;
- Laboratory/Paramedical Support;
- Financial Management;
- Administration;
- General Services; and
- Outpatient Department.

The current computer is said to be running at less than 40% utilisation.

3.138 Appendix 6.2 of the Supplement is a report entitled 'Study of Selected Hospitals and Health Care Organisations using PCS Based Applications in the United States and Canada - October 1985' prepared by the Health Department of Western Australia.⁹² It indicates that Stony Brook Hospital has 540 beds, 2490 staff, 105 applications, and a 3083EX computer.

3.139 The DVA argue that based on the experiences of the above hospitals the 4381 range of computers is adequate to the needs of the RGHs for the next 5 years.

3.140 The CPU loading for a particular RGH would depend on the number of times terminals access the computer in a given period, the amount of processing required for each of these accesses and the rate of arrival of these accesses. The DVA have used proxies for these measures such as number of beds, number of software modules in use, and number of users and then compared these with other hospitals to gain a rough approximation of their relative needs.

3.141 This estimation process is error prone. For example, the effectiveness of the existing computer systems implemented in hospitals would need to be determined. One would also need a good understanding of the way individual hospitals were organised, the usage levels for each software module in the hospital's operations and the level of understanding users have of the system they are using, in order to make confident comparisons. On the basis of the information supplied, Royal Adelaide Hospital is larger than Concord RGH yet the DVA plan to install a machine with the order of 50% more processing capacity. The process of estimating capacity requirements in this manner presumes that other users have accurately determined their requirements, which may not always be the case. Some of the hospitals referred to are long established users of PCS and have not always operated at their current CPU capacity.

3.142 The DVA clearly have an ordered implementation plan extending to June 1988.⁹³ The Committee has some concerns about the DVA ability to achieve its predicted rate of implementation of hospital modules and therefore the rate at which RGHs will increase computer capacity usage. This is discussed further in the section Rate of Implementation below.

3.143 The Committee has already accepted that, based on DVA network strategies, a 4381-equivalent computer is needed for each RGH.⁹⁴ The Committee is unable, on the above evidence to form any opinion of the degree of loading that any RGH might experience on its computer or how the degree of loading might increase over the 5 year period.

89. Appendix 3, page 222.

90. Department of Veterans' Affairs, Computerised Hospital Information Systems, Report on U.S. Study Tour by FAS(S), 29 May - 21 June 1985, page 69.

91. Appendix 3, pages 221 and 222.

92. Appendix 3, pages 258 and 260.

93. Appendix 3, page 288.

94. Estimation of CPU Capacity Requirements, Chapter 3, page 49.

3.144 The recent IBM announcement of new 4381 models with improved price performance characteristics injects another element of uncertainty in an unquantified CPU capacity justification.

3.145 It should be possible for the DVA to predict its CPU usage in the foreseeable future reasonably accurately using estimates of expected usage of each hospital software module. The CPU costs of using PCS modules should be able to be estimated by the Department of Veterans' Affairs from its experiences during the joint development of APMS and from its contacts with overseas hospitals.

3.146 The Committee concludes that:

- insufficient evidence has been supplied to enable the Committee to be assured that Repatriation General Hospital Concord and Repatriation General Hospital Heidelberg require more capacity than the base power of the 4381 range of IBM computers.

3.147 The Committee recommends that:

- the Department of Veterans' Affairs supply to this Committee a chart of expected demand for computing capacity before any order is placed for a computer for both Concord and Heidelberg Repatriation General Hospitals. The chart should differentiate the expected computer capacity usage of the various hospital software modules as their usage rises over time.

Location of Computer at NCC Site or RGH Sites

3.148 The DVA proposal calls for a separate computer for each RGH. The only cost/benefit analysis represented in the DVA documents was carried out by the Disc International consultancy. This analysis compared the proposed plan with the existing partially automated but largely manual operations at RGHs. It did not analyse any alternatives to the proposed plan. The DVA canvassed briefly in its Submission an option for an expanded NCC to support the RGHs computing needs. That option was rejected on qualitative grounds as follows:

- RGHs require servicing of hospital management information needs on a seven day twenty-four hour operating basis;⁹⁵
- RGHs require local responsibility for the determination and implementation of information systems;⁹⁶

95. Appendix 1, page 88.

96. Appendix 1, page 88.

- RGHs require reliable computer operations and service with minimal dependence on extended national telecommunications links;⁹⁷
- RGHs require improved backup to computer operations through decentralised installations;⁹⁸
- the RGHs will most likely transfer to the State system, or otherwise as Government decides, at about the end of the century;⁹⁹ and
- the opportunity for external systems development to address patient care and services effectively and efficiently has been limited in the absence of local hospital mainframe computing facilities under the control of RGH management.¹⁰⁰

3.149

The DVA indicate in the Supplement that:

An analysis of the costs of the central approach, if it was to provide the same level of service and security to PCS users, would reduce five year acquisition and operations costs by 10-15%, compared with the proposed decentralised approach.¹⁰¹

3.150 While it is not clear which project cost estimate this reduction should be applied to, it amounts to between \$1.46m and \$2.19m of the 4 year \$14.6m cost for hardware, software and site preparation in the revised NPP. If the reduction is applied to the 5 year \$20.5m costs for hardware, site preparation, software, maintenance, PCS staff costs, and operations and implementation staff costs in the Disc Report it amounts to \$2m - \$3m.

3.151 The DVA do point out that no comprehensive cost/benefit analysis of a centralised approach to RGH hospital services has been carried out.¹⁰²

3.152 However there are usually significant cost savings associated with a central large computer in comparison with several smaller decentralised computers. These cost savings should be evaluated against the benefits of the decentralised approach.

3.153 The Committee notes that PCS is being used overseas by several hospitals accessing a central computer. Appendix 5 of the Supplement describes the progress made by the New Zealand Department of Health in implementing its PCS software.¹⁰³ The

97. Appendix 1, page 105.

98. Appendix 1, page 105.

99. Appendix 1, page 90.

100. Appendix 1, page 104.

101. Appendix 3, page 196.

102. Appendix 3, page 196.

103. Appendix 3, page 250.

Health Computing Strategic Plan, February 1986, of the Department indicates that it plans to complete the installation of PCS in all 40 hospitals over 200 beds in size by mid 1986 based on a computer in each of Christchurch and Auckland.¹⁰⁴ The Committee also understands the Singapore Government has five large hospitals using PCS on a central computer.

3.154 The Committee asked the DVA whether a more reliable operations on a 24 hour basis would result if computers were located in individual RGHs. The DVA response in the Supplement was¹⁰⁵:

RGH managements will be able to determine the operating hours of their computing facilities according to hospital needs.

The implementation of the patient data base and on-line order entry and result reporting requires reliable computing services. A remote central facility may not be sufficiently reliable owing to pressures to economise in its large-scale operation. The NCC provides reduced levels of service at weekends and no service at all is currently available between 11pm and 7am. It would be uneconomical for the NCC to provide a 24 hour service to the hospitals owing to the necessary but low systems usage in the third shift. Hospital computers could be unmanned during that shift.

155 While the DVA claims that 24 hour operations are necessary, there will always be some periods when necessary backups of data bases need to be made to protect data against hardware or software failures. This and other scheduled periods when the computer is not available are in the control of individual RGH managements whereas with a central system these periods would need to be scheduled at times generally suiting all RGHs. It should be noted however that all RGHs would opt for a period in the early hours of the morning when use of the system was at a minimum.

3.156 In a centralised approach, the modus operandi of the NCC would obviously not be to close down overnight. Just as the RGH plan to have the computer available for access but unmanned in the period of light use, so too could the NCC computers operate in that mode. The Committee considers that the need to economise for all use of computers is important whether centralised or decentralised and that economies sought should have due regard to the consequences for service.

104. New Zealand, Department of Health, Health Computing Strategic Plan, 24 February, 1986, page 28.

105. Appendix 3, page 203.

3.157 The Committee concludes that:

- an expanded National Computer Centre could service Repatriation General Hospitals needs on a 24 hour basis if required with only slightly reduced reliability and some slight inconvenience to Repatriation General Hospitals during periods when the computer is dedicated to data base backups.

3.158 The ability for RGHs to have responsibility for the documentation and implementation of information systems is suggested as an argument for decentralised computer sites. However the DVA strategy is for the PCS team to produce as far as possible common solutions for the hospitals' common functional requirements. Initially this development will be carried out centrally by the PCS team and subsequently some systems may be developed by individual RGHs for their own purposes or on behalf of other RGHs.

3.159 The fact that PCS software is written in PCS/ADS, a fourth generation language, allows individual hospitals to make changes to the 'standard' software module for their own requirements. These amendments will mainly take the form of changes to screen and report formats which are easily made in the PCS system. Such changes do not affect the PMI and the processing functions performed on them.

3.160 As RGH staff become familiar with PCS/ADS it is possible that they will develop the capability to alter the processing functions of the software module in addition to the user interface functions mentioned above. While the capability to alter processing functions might exist, the advantage of all hospitals using the same versions of processing software should be carefully weighed up against the advantages to any RGH of being able to make changes for their own purposes. In the extreme, changes to the structure of the PMI might render further integration of software modules impossible. Software support arrangements both internally in the Department and with external agencies can become complex when different versions of a software module are used.

3.161 If the DVA do not allow individual RGHs to amend processing functions then software standards across RGHs could readily and economically be supported centrally.

3.162 The Committee recommends that:

- the Department of Veterans' Affairs establish clear guidelines concerning the degree to which changes to the Patient Care System software can be undertaken by Repatriation General Hospital staff and the circumstances under which such changes should be attempted.

3.163 The DVA have indicated that individual hospitals will determine the rate of implementation of software modules based on their needs and will set their own priorities for the order in which modules will be implemented. While this is true the software available for individual RGHs to choose from will, for some time, be that available as a result of the activities of the PCS team and is independent of whether the computer used by RGHs is at the RGH or the NCC.

3.164 The reliability of a remote site was raised as an issue. The DVA claim in the Supplement that¹⁰⁶:

It is apparent that hardware reliability in overseas PCS installations is very high. DVA is confident that twenty-four hour operations can be reliably maintained at the RGHs.

3.165 There is no reason to expect that a central computer will be significantly less reliable. The telecommunication links between the RGHs and NCC are an additional source of system unavailability but no evidence has been supplied to indicate that the additional periods when the computer was not available due to the communication links are significant.

3.166 The DVA claim that improved backup for computer operations will result from decentralised operations. In a centralised configuration, a dual computer could supply a degree of backup. However, if this dual computer were to be housed at a single site, a substantial period when the computer was unavailable or permanent damage to the system would mean that the Department would be without its hospital systems. The two computers could be housed separately to provide a reduced operating capacity if one failed, thereby adding to the expense of a centralised strategy. Indeed, if backup of Department computers is a significant issue, the housing of NCC computers should be investigated whether RGH computing capacity is supplied centrally or not.

3.167 In a decentralised strategy, the loss of a computer at one RGH site for a significant period of time can be overcome by communication links to other RGHs. This would add to the cost of the decentralised approach.

3.168 In either case the backup requirement will lead to additional costs and on the information supplied it is difficult to mount a case for either strategy. It is necessary for DVA to determine the level of backup.

106. Appendix 3, page 214.

3.169 The DVA indicate in the Supplement that:

On-line backup of RGH systems, through the maintenance of duplicated data bases at another RGH, is not expected to be cost effective. Back-up arrangements will be developed to accommodate extended system unavailability as at present.¹⁰⁷

Effective backup to another RGH site will depend on the availability of the telecommunication link, adequate computing capacity and transfer of the patient data base.¹⁰⁸

During short periods of system unavailability, (usually for less than a day) computer access to update data bases or [the ability] to enquire as to eligibility will be suspended. Input may be batched when the system again becomes available.

Where order entry of tests, reporting of results or access to medical record abstracts is disrupted, manual processes will be available so that patient care levels are maintained.

The management of outpatient scheduling will proceed on the basis of hard copy daily status reports of scheduled services.

It will be an important feature of pilot testing to ensure that essential hospital services can be sustained during a period of hardware failure. Recovery procedures must also be in place. DVA will liaise with other PCS users in Australia and overseas on the techniques that have already been developed.

For extended [periods of time when the computer was not available] ..., communication may be available through the [Front End Processor] FEP to the [existing] DVA network and to other RGH computing facilities. The PMI will be archived at least on a daily basis in each RGH and a copy would be available for mounting on another RGH computer.¹⁰⁹

3.170 The Committee concludes that:

- regular backup of the Patient Master Index and transfer of the Patient Master Index from one Repatriation General Hospital to another, provide the basis for backup arrangements in the event of extended periods when the system is not available.

107. Appendix 3, page 200.

108. Appendix 3, page 215.

109. Appendix 3, page 214.

3.171 The APMS replaces the current ADT system and staff involved in the use of these systems are familiar with backup and recovery arrangements. The DVA indicate that manual processes will be resorted to for short term outages. When new software modules are first implemented the staff involved will still be familiar with the old manual methods but with the passage of time memory fades and new staff may never have worked on the manual system.

3.172 The Committee recommends that:

- The Department of Veterans' Affairs design its backup and recovery procedures prior to implementation and that these procedures should be tested prior to production use.

3.173 The transfer of RGHs to State health systems, if it takes place, is expected at the turn of the century. The computers acquired in 1986 would then be 14 years old and beyond their economic life.¹¹⁰

3.174 The Committee concludes that:

- the argument relating to the transfer of Repatriation General Hospitals to States' hospital systems carries little weight in the centralised/decentralised computer system issue.

3.175 Other advantages of a decentralised approach included are that capital funds are not all required at the commencement of the project. Additionally the need to resort to large incremental expansions in a centralised configuration can lead to budgetary difficulties.

3.176 The DVA is currently installing a second Amdahl processor in its NCC. The Committee is not aware of any analysis of costs and benefits that have been carried out on options centering on IBM or IBM-compatible machines to support part of the NCC processing load and RGH needs in a single proposal. Originally in 1981/82 the DVA were preparing to install an upgraded NCC and PCS software to support Central and Branch Office processing and in addition meet RGH needs.

3.177 The Committee is of the opinion that the DVA should have compared an option to support RGHs from a NCC with the proposed option. However, at this stage in the acquisition process, the Department and its staff are committed to the decentralised RGH computer approach and a change of strategy at this time would lead to staff disenchantment and Departmental loss of impetus. The Committee is concerned to find itself in the position of analysing a proposal under such circumstances.

110. Transfer of RGHs to States' Hospital Systems, Chapter 3, page 66.

Conclusion

3.178 The Committee concludes that:

- the Department of Veterans' Affairs has not seriously analysed any alternatives in its proposal;
- although a centralised option based on a National Computer Centre was dismissed on qualitative grounds, it deserved serious quantitative evaluation;
- the case for a decentralised, as opposed to centralised, strategy was insufficiently examined;
- on the evidence available it is unable to decide whether the 10-15% reduction in costs of a centralised computer system is valid or not;
- it is unable to weigh up the Department's qualitative arguments for decentralised Repatriation General Hospital computers against the potential cost savings; and
- the Department of Veterans' Affairs is not able to indicate, by effective comparison between alternatives, that its proposal is the best it can make.

Recommendation

3.179 The Committee recommends that:

- the Department proceed with the acquisition of Repatriation General Hospital computers on the grounds that:
 - the Department is now heavily geared to the decentralised option;
 - other National Computer Centre actions are already in hand; and
 - no clear evidence exists to recommend other options.

Rate of Implementation

3.180 The DVA's draft Patient Care Project Plan 1986-88 is in Appendix 7 of the Supplement. The plan indicates that DVA will implement by July 1988 six supplementary software modules in addition to the basic inpatient management system (APMS). These supplementary modules are:

111. Appendix 3, page 288.

- Outpatient Scheduling;
- Medical Records Abstracts;
- Pharmacy;
- Orders Entry/Reporting;
- Stores Inventory Management; and
- Pathology.

3.181 In addition, as indicated in the Disc Report, DVA will work with IBM to develop and incorporate three additional sub-systems into APMS for infection control, nurse loadings and food services functions. The inclusion of these additional sub-systems will allow PCS to provide the same level of facilities that are present in the current ADT hospital computer systems.

3.182 The Supplement lists 23 duties of the PCS team covering analysis of requirements, program design, program testing, documentation, evaluation of existing software, problem resolution and support of existing modules, liaison and staff training, maintenance of existing modules, and data conversion from the existing systems.¹¹²

3.183 The PCS team will comprise, when fully staffed, 9 officers including 2 implementation staff and 7 Computer Systems Officers (CSOs).

3.184 The PCS team will be working on the development of all of the above systems in the December quarter of 1986. This would mean that the 7 CSO's will be working on the development of the three additional sub-systems, the six supplementary software modules as well as assisting the implementation staff with any difficulties they might be encountering with implementation of APMS. Notwithstanding the staggering of the development and implementation of these systems this program will place an extremely heavy workload on the PCS team.

3.185 The DVA have indicated in their Answers to Supplementary Questions that it still intends to follow this very ambitious implementation program as set out in the Draft PCS Project Plan.¹¹³ However, the DVA have also indicated that the rate of implementation will also be determined by the¹¹⁴:

- ability of the central PCS team and individual RGHs to affect changes to the management of patient care;
- availability of new PCS application modules of interest to the Department;

112. Appendix 3, pages 206 and 207.

113. Minutes of Evidence, op.cit., page 103.

114. Ibid, page 103.

- cost effectiveness of individual PCS application proposals; and
- ability to assign PCS application development responsibilities to RGHs other than RGH Concord in accord with individual RGH interests, priorities and skills.

3.186 The Committee understands that the Outpatient Scheduling system will be a completely new development, and that the Pathology system will comprise a significant amendment to an existing package designed for pathology laboratories whose requirements are somewhat different from hospital pathology departments. Other systems will perhaps be acquired from overseas and need varying degrees of amendment and adaptation to meet RGH requirements. The Committee understands that, for each of the modules, a requirements definition is to be prepared. This can only be carried out after a thorough understanding of the function to be implemented has been gained. Next a number of applications modules must be examined and their capabilities matched against the requirements definition. Then the internal characteristics of the chosen software module must be understood in order to identify the changes necessary to modify the capabilities of the module to meet the requirements definition. Finally the necessary changes have to be designed, programmed and tested and the modified module implemented.

3.187 The DVA intends to enter joint developments with IBM, other software companies and other Australian PCS users with a view to minimising the workload involved in changing application software. It appears to the Committee that to propose a project plan which presumes early benefits accruing from the work of others over whom little control, subject to joint development contractual agreements, can be exercised is not a sound or sensible practice.

3.188 The Committee concludes that:

- it is doubtful whether the Patient Care System team, which has yet to be fully restaffed and gain the full Patient Care System experience, will be able to affect the scheduled workload in the Draft Patient Care Project Plan.

3.189 The initial APMS including the three additional sub-systems will replace the existing ADT system and should only have a minimal impact on those staff currently using the existing ADT system. As APMS begins to be accessed by other staff its impact will be more strongly felt. It is expected that these staff will take longer to become familiar with the APMS system. In addition, new users without computer skills or experience of existing computer systems will not be able to effectively use a number of new systems until some considerable time has elapsed.

3.190 The Committee is concerned that areas such as nursing stations may not be able to learn to use their new computer systems as fast as software modules are implemented.

3.191 The Committee recommends that:

- the Department of Veterans' Affairs monitor achievements against the project plan closely so that when and if slippages occur, it is able to reprogram the plan early and with minimum disruption to staff training and the Department of Veterans' Affairs planning.

Performance Monitoring

3.192 The Committee is aware of the difficulties in fully defining and quantifying benefits associated with major computer systems proposals, particularly where such benefits are largely in the form of the enhanced effectiveness resulting from, for example, better management information or improved and more rapid services such as to Veterans and the public in RGHs.

3.193 However the Committee has noted that many departments and agencies have done little more than list the types of benefits asserted when putting forward such proposals. This may be a result of a reluctance on the part of these agencies to be subsequently held to account for their performance in achieving tangible or quantifiable levels of benefits.

3.194 The Committee concludes that:

- in most instances, the quantification of benefits, resulting from computer acquisitions stating levels of variance and uncertainty, is a practicable and useful process and should be undertaken; and
- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realised.

3.195 The Committee believes that in all instances benefits should be defined at least to the extent that a clear specification of output indicators and performance monitoring measures can be given at the commencement of the project. The very nature of computer technology facilitates the incorporation of monitoring systems to permit measurement of their performance and of the benefits which result from their implementation.

3.196 The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved.

3.197 At the Committee's hearing the DVA listed the following benefits which would result from the implementation of an integrated hospital information system in RGHs using PCS:

- The computer proposal was aimed at improving the quality of patient care in RGHs¹¹⁵;
- there would be vastly improved treatment services and rather more convenience to our aged clients¹¹⁶; and
- as regards cost benefits, (DVA) had a consultancy conducted by DISC International which came to the conclusion that the 5 year cost-benefit would be around 1:1.81 with costs of \$20.4m over that period and benefits of \$37.1m.¹¹⁷

(The Answers to Supplementary Questions amends this data to 1:1.76, \$20.4m and \$36m respectively).

3.198 The Disc consultancy confined its analysis to the costs and benefits resulting from initial acquisitions, to up-grades to hardware expected in the first 5 years of the project and to the hospital functions of Admissions, Discharges, Appointment Scheduling and Orders Entry/Reporting. The quantified annual benefits are laid out in Table 2 of the Disc Report.¹¹⁸

3.199 It is clear that the major portion of the quantified cost savings can be clearly identified and measured. Other cost reductions are in the areas of reduced staffing requirements for Nursing Station/Clerical staff, automatic printing of drug selection instructions, order status enquiries, wastage of consumables, improved scheduling and management opportunity. The DVA have managed the quantify the cost reductions in these cases but it is not as clear as to how one could demonstrate that the savings had been made.

3.200 The Committee recommends that:

- the Department of Veterans' Affairs prepare a set of performance measures for the Patient Care System project once the initial system has been established at Concord Repatriation General Hospital; and
- the Department of Veterans' Affairs attempt to quantify in some terms benefits relating to improved health care and patient convenience.

115. Minutes of Evidence, op. cit., page 5.

116. Ibid, page 9.

117. Ibid, page 9.

118 Appendix 7, page 323.

Potential Participation by Australian Software Industry in Hospital Systems

3.201 Currently there are at least three users of PCS in Australia. Royal Adelaide are using a version of PCS modified for their purposes in-house. They will shortly begin to use APMS. A Queensland pathology laboratory uses a pathology system produced in Australia using PCS. The DVA uses the USA version of PCS for training purposes. The Committee is aware of a significant interest in PCS for use in larger Australian hospitals that may generate further PCS sites in Australia once investigations currently underway are concluded.

3.202 The Department of Health Annual Report 1984/85 indicated that there were almost 1100 hospitals in Australia. While a number of these hospitals are small and may not be viable users of PCS and a number of hospitals already have integrated information systems planned, in the process of development, or in place, the Committee is of the opinion that a sizeable market exists for larger hospitals (say greater than 200-250 beds) which could potentially be satisfied using PCS.

3.203 The initial step for hospitals wishing to use PCS is to implement the APMS for admissions, discharges and transfers functions and to establish the hospital's PMI. Following that there is a vast array of hospital functions that could be potentially implemented depending on the functions of individual hospitals. Attachment 5 of the Supplement lists some 150 applications already developed by IBM, third party vendors, hospitals or other health care organisations. The list is not exhaustive and is growing.

3.204 While a large body of software exists it is largely oriented to USA hospital requirements which exhibit some differences to Australian hospital requirements, particularly in the area of method of billing. As a result, the PCS software needs some modification before it can be used by Australian hospitals.

3.205 The core module has been modified in a joint development project by IBM, Royal Adelaide Hospital and the DVA. As a result, the PMI data base has been adjusted in such a way as to suit Australian content needs but at the same time to be substantially compatible with overseas software modules that Australian hospitals may subsequently wish to acquire. Individual hospital needs may necessitate further enhancements to acquired software.

3.206 The USA market has been serviced by products supplied by IBM, software organisations and by individual hospital developments. A number of products have been produced by joint developments between IBM and individual hospitals, IBM and software houses and software houses and individual hospitals.

3.207 In addition IBM has established its Health Industry Centre and indicated that one of its roles is to develop an application set of software systems and packages to meet the needs of the Australian health industry. The development process is being undertaken in conjunction with hospitals and other groups in the health field, and IBM's role is to ensure that the resulting application set is as integrated as is possible and can be used across a broad spectrum of the industry.

3.208 To date, IBM have been involved in the APMS joint development and have also worked with Australian companies in the development of other non-PCS hospital software.

3.209 The Committee concludes that:

- there may be a substantial market for the acquisition of overseas Patient Care System software and the modification of such software to enable it to be integrated with the IBM Australian Patient Management System and to meet individual hospital requirements using Patient Care System/Application Development System; and
- potential exists for Australian software organisations to become involved in the Patient Care System hospital market.

Transfer of RGHs to States' Hospital Systems

3.210 The Brand Report recommended that effective rationalisation take place between the repatriation hospital system and the States' hospital systems. The Brand Report indicated that the integration should occur in approximately 15 to 20 years.¹¹⁹

3.211 The Brand Report also indicates that major equipment with life spans considerably less than 15 or 20 years should not be affected by any longer term integration.¹²⁰

3.212 The computer systems currently in use in States' hospitals are many and varied. The New South Wales Department of Health have a policy of standardisation on in-house developed integrated hospital information software operating on Digital Equipment Corporation equipment. However, several major hospitals have developed their own software incompatible with any other software. The Burroughs hospital system MEDILINC is implemented in five major Australian hospitals. The McDonnell Douglas system, THIS, is implemented in a significant number of hospital and health care institutions. The IBM package PCS is in use at Royal Adelaide and a Queensland pathology laboratory.

119. Brand Report, op cit., page 23.

120. Ibid, page 23.

3.213 It is not therefore possible for the DVA to acquire software compatible with all States' current software systems or software systems that States might acquire. The Committee is aware that a number of health care agencies are currently investigating PCS and it expects that before integration of RGHs and States' hospital systems takes place, PCS and other software will have found wider use in State hospitals.

3.214 All the current software developments in the hospital area including those already mentioned are designed to be integrated, on-line, real-time hospital management systems accessing a number of data bases. A central feature of all systems is the Patient Master Index data base. To this extent the system architecture of PCS and the manner in which hospitals will use the software is compatible with the type of systems that are likely to be in place when integration of State and RGH hospitals may occur. The DVA claim in the Answer to Supplementary Questions that all States are planning or currently implementing integrated, patient-based information systems in their larger public hospitals.¹²¹

3.215 The Committee concludes that:

- the integration of States' hospitals and Repatriation General Hospitals is expected to take at least 15 years to complete which is greater than the economic life of the equipment proposed for the Repatriation General Hospitals; but
- if integration of Repatriation General Hospitals and States' hospital systems occurs during the lifetime of the proposed equipment, neither hardware nor software which Department of Veterans' Affairs is proposing for Repatriation General Hospitals will present any more of a difficulty for integration into States' hospitals than other possible options.

121. Minutes of Evidence, op cit., page 105.

CHAPTER 4

LIST OF CONCLUSIONS AND RECOMMENDATIONS

4.1 This chapter contains a list of all the conclusions and recommendations from the body of the report. Chapter 1 is a summary of the Committee's findings and therefore there is some duplication between Chapter 1 and Chapter 3 conclusions and recommendations. In addition the conclusions and recommendations relating generally to Government agencies are collected together and reproduced in Chapter 1 thereby producing some additional duplication. Conclusions and Recommendations below are cross-referenced to their locations in the text. The Committee's analysis in the text should be referred to when considering these conclusions and recommendations.

Chapter 1 - Summary of Findings

Major Conclusions and Recommendations

4.2 The Committee concludes that:

- the Department of Veterans' Affairs has not to date conducted the Patient Care System project in a manner consistent with existing planning guidelines and sound project management practices;
- there is a need for improved hospital services for the veteran community;
- Repatriation General Hospital management and staff operate under difficulties due to inadequate computer systems;
- the computing systems at Repatriation General Hospitals generally lag well behind those available in other public hospitals; and
- some form of integrated hospital information system is the most effective way for the Department of Veterans' Affairs to proceed to satisfy Repatriation General Hospital information requirements and that the Patient Care System offers the only appropriate vehicle to achieve this in an IBM compatible environment. (Paragraph 1.2).

4.3 The Committee recommends that:

- the Department of Veterans' Affairs proceed with its negotiations with the Department of Finance and the Department of Local Government and Administrative Services with a view to the acquisition of computers for the Repatriation General Hospitals;

- the Department of Veterans' Affairs supply the Committee, with comments from the Department of Finance, information on computer capacity requirements before placing an order for a computer at Repatriation General Hospital Concord;
- the Department of Veterans' Affairs respond to the other Committee recommendations through the Minister for Finance Minute mechanism prior to proceeding beyond the purchase of the Concord computer;
- the Department of Local Government and Administrative Services decides on the method of acquisition; and
- should the Department of Local Government and Administrative Services accept the arguments put to it by the Department of Veterans' Affairs for a Certificate of Exemption for an IBM computer for Repatriation General Hospital Concord, a supply and development contract be concurrently negotiated with IBM which ties further development and support for the Patient Care System related software to the initial IBM computer acquisition. (Paragraph 1.3).

The Patient Care System Project

4.4 The Committee concludes that:

- the Patient Care System project has been delayed for a considerable period of time as a result of poor decision making, misunderstanding and mismanagement.

The Committee recommends that:

- the Department of Veterans' Affairs make maximum use of its already established committee structure to ensure that the Department's commitment is translated into the necessary support and guidance to create a healthy project team environment for systems implementation. (Paragraph 1.7).

4.5 The Committee concludes that:

- there is an urgent need to complete the data analysis and carry out a functional analysis of hospital functions prior to acquisition of software modules. (Paragraph 1.8).

4.6

The Committee concludes that:

- although a centralised option based on a National Computer Centre was dismissed on qualitative grounds, it deserved serious quantitative evaluation; and
- the case for a decentralised, as opposed to centralised, strategy was insufficiently examined. (Paragraph 1.11).

4.7

The Committee recommends that:

- the Department proceed with the acquisition of Repatriation General Hospital computers on the grounds that:
 - the Department is now heavily geared to the decentralised option;
 - other National Computer Centre actions are already in hand; and
 - no clear evidence exists to recommend other options. (Paragraph 1.12).

4.8

The Committee concludes that:

- the cost/benefits analysis carried out by the Department of Veterans' Affairs for this project is deficient in the following respects:
 - the Department of Veterans' Affairs has not presented its project costing data in a comprehensive and consistent manner thereby making it difficult for the Committee to reach confident conclusions about the total costs and the benefits of the proposal;
 - discrepancies exist in the cost estimates and some costs appear to have been omitted;
 - the estimated benefits appear to be conservative and were not determined for the full range of software expected to be acquired or developed;
 - other unquantified benefits will accrue to the proposal; and
 - intangible benefits, such as better health care and patient convenience, will also accrue to the project.

The Committee recommends that:

- the Department of Veterans' Affairs institute a cost monitoring and control system such that accurate, timely and comprehensive project costing information is readily available to the Department of Veterans' Affairs management and external regulatory authorities; and
- the Department of Veterans' Affairs report to the Department of Finance its revised estimates of the Patient Care System project costs and benefits, any subsequent change in direction of the Patient Care System project and any increase in costs or additional cost to be incurred under the auspices of this project. (Paragraph 1.13).

4.9 The Committee concludes that:

- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realised. (Paragraph 1.14).

The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved. (Paragraph 1.15).

4.10 The Committee recommends that:

- the Department of Veterans' Affairs supply to this Committee a chart of expected demand for computing capacity before any order is placed for a computer for both Concord and Heidelberg Repatriation General Hospitals. The chart should differentiate the expected computer capacity usage of the various hospital software modules as their usage rises over time. (Paragraph 1.17).

4.11 The Committee concludes that:

- it is doubtful whether the Patient Care System team, which has yet to be fully restaffed and gain full Patient Care System experience, will be able to affect the scheduled workload in the draft Patient Care Project Plan. (Paragraph 1.18).

The Current Proposal

4.12 The Committee concludes that:

- for the Department of Veterans' Affairs' purposes the alternative, non IBM-compatible, integrated hospital information systems do not offer advantages over the Patient Care System;
- the Patient Care System appears to be the only suitable system for the Department of Veterans' Affairs in the IBM compatible market; and
- any tendering process should be restricted to the IBM-compatible market. It notes that the Department of Local Government and Administrative Services is in agreement with this view. (Paragraph 1.24)

4.13 The Committee concludes that:

- at the time of the purchase of the Patient Care System, the Department of Veterans' Affairs did not recognise the implications of its software acquisition; but
- earlier mismanagement of the Patient Care System project and underestimation of the nature and size of the project have played a role in the Department's decision to seek a Certificate of Exemption for the Concord Repatriation General Hospital computer. (Paragraph 1.24).

4.14 The Committee recommends that:

- departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications. (Paragraph 1.25).

4.15 The Committee concludes that:

- a case exists for the Department of Veterans' Affairs to call tenders for IBM-compatible equipment, and the acquisition and support for the Australian Patient Management System to determine the level of support for the Patient Care System in the marketplace;
- there may be a case for the granting of a Certificate of Exemption in favour of IBM for the Concord Repatriation General Hospital computer based on the special level of support for the Patient Care System that the Department of Veterans' Affairs claim they require from IBM; and
- the decision on the method of acquisition properly rests with the Department of Local Government and Administrative Services. (Paragraph 1.27).

4.16 The Committee concludes that:

- no arguments exist for the Department of Veterans' Affairs restricting or avoiding public tendering in order that available funds be expended in 1985/86. (Paragraph 1.28).

4.17 The Committee recommends that:

- the acquisition proceed expeditiously commensurate with proper tendering procedures. (Paragraph 1.29).

General Conclusions and Recommendations for Future Computer Projects

4.18 The Committee recommends that:

- departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications. (Paragraph 1.30).

4.19 The Committee concludes that:

- in most instances, the quantification of benefits, resulting from computer acquisitions stating levels of variance and uncertainty, is a practicable and useful process and should be undertaken; and
- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realised. (Paragraph 1.31).

4.20 The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved. (Paragraph 1.32).

Chapter 3 - Major Issues

Matters Arising from the Brand Report

Analysis of User Requirements

4.21 The Committee concludes that:

- the proposed integrated hospital management system is not based on a detailed analysis of the functional requirements of Repatriation General Hospital users but rather on the presumed analogous requirements of other users;
- the Department of Veterans' Affairs' strategy is modelled on the successful implementation strategy of a number of other hospital systems;
- the degree of success of the project will depend on the degree of compatibility between the real user requirements and the capabilities of overseas software;
- the greater the divergence between user requirements and software functionality the more expensive will be the cost of adding new functions as the number of functions already implemented increases; and
- the Patient Master Index is central to that implementation and the data analysis consultancy currently underway should put the planning for the Repatriation General Hospital information system on a better footing. (Paragraph 3.13).

4.22

The Committee recommends that:

- the data analysis consultancy be concluded as soon as possible and its results be used to prepare a conceptual data base design for the total integrated hospital information system;
- an analysis of processing functions be carried out in addition to the data analysis study currently under way;
- it is highly desirable that this functional analysis be completed by the Department of Veterans' Affairs before it proceeds beyond the initial transfer of known Admissions, Discharges and Transfers functions to the new computing network; and
- the Department of Veterans' Affairs modify its project plans based on the understanding of its requirements once the data analysis and functional analysis are completed. (Paragraph 3.15).

Consultation with Staff

4.23

The Committee concludes that:

- extensive and ongoing consultation has taken place between Central Office staff and Concord Repatriation General Hospital senior medical managerial staff involved with the current Admissions, Discharges and Transfers system;
- consultation with other user staff has not been adequate in the period up to mid-1985 but that staff consultation for the Admissions, Discharges and Transfers functions has improved considerably in the period since; and
- the level of staff consultation for staff not scheduled to use automation in the near future is not adequate. (Paragraph 3.22).

4.24

The Committee recommends that:

- the Department of Veterans' Affairs take steps to inform its staff of the strategy for implementation of its integrated hospital information systems, the benefits accruing from the degree of integration, and management commitment to the strategy; and

- the Department of Veterans' Affairs provide and update as early as possible details for implementation of individual hospital functions, including timings, to staff. (Paragraph 3.23).

Consultation with Staff Associations

4.25

The Committee concludes that:

- the Department of Veterans' Affairs consultation with staff associations commenced after the Department decided to base its future integrated hospital information system on the Patient Care System, but that these consultations are still in a preliminary stage. (Paragraph 3.30).

4.26

The Committee recommends that:

- the Department of Veterans' Affairs prepare a broad Job Impact Statement in conjunction with staff which addresses the impacts on staff numbers, duties, organisational arrangements and the work environment generally where manual systems are to be replaced by on-line, real-time computer systems and that this statement be widely circulated and discussed with relevant staff associations; and
- the Department of Veterans' Affairs prepare Job Impact Statements for each function to be implemented at the earliest possible time before the completion of the specification stage. (Paragraph 3.31).

Patient Care System Project Management

4.27

The Committee concludes that:

- from an analysis of Departmental documentation supplied and from the other independent consultants' reports, it is clear that in the period to May 1985:
 - the project did not have sufficient project management experience for a project of the nature and size of the Patient Care System project;
 - the project's working environment was characterised by personality conflicts and low morale;
 - relationships between the Central Office and the project team had deteriorated;

- there was a lack of commitment to the Patient Care System team from Central Office due to its underestimation of the amount of modification needed for the Patient Care System to meet Repatriation General Hospital requirements;
- the Patient Care System was purchased without a proper study of requirements; and
- these factors were the major contribution to the project's failure. (Paragraph 3.37).

4.28 The Committee concludes that:

- the Patient Care System project has been delayed for a considerable period of time as a result of poor decision making, misunderstandings and mismanagement;
- the Department of Veterans' Affairs has moved to correct these problems since early 1985 by the use of consultants and new staff appointments; and
- while the Department of Veterans' Affairs recovered some ground, much needs to be done before the infrastructure for the implementation of an integrated hospital information system is in place. (Paragraph 3.42).

4.29 The Committee recommends that:

- the Patient Care System project be given a high priority in view of the effect on morale of Repatriation General Hospital staff if the project falters yet again; and
- the Department of Veterans' Affairs make maximum use of its already established committee structure to ensure that the Department's current commitment is translated into the necessary support and guidance to create a healthy project team environment for systems implementation. (Paragraph 3.43).

Method of Acquisition

4.30 The Committee concludes that:

- for the Department of Veterans' Affairs' purposes the alternative, non IBM-compatible, integrated hospital information systems do not offer advantages over the Patient Care System;

- the Patient Care System appears to be the only suitable system for the Department of Veterans' Affairs in the IBM-compatible market; and
- any tendering process should be restricted to the IBM-compatible market. It notes that the Department of Local Government and Administrative Services is in agreement with this view. (Paragraph 3.56).

4.31

The Committee concludes that:

- at the time of purchase of the Patient Care System, the Department of Veterans' Affairs did not recognise the implications of its software acquisition; but
- earlier mismanagement of the Patient Care System project and underestimation of the nature and size of the project have played a role in the Department's decision to seek a Certificate of Exemption for the Concord Repatriation General Hospital computer. (Paragraph 3.80).

4.32

The Committee recommends that:

- Departments include in their Strategic Plans a clear statement where the proposed acquisition of software is subsequently likely to involve or influence hardware expenditures;
- this information be explicitly drawn to the attention of the Department of Finance, the Department of Local Government and Administrative Services and this Committee; and
- the Department of Finance and the Department of Local Government and Administrative Services examine ADP Strategic Plans and software acquisition proposals to identify potential hardware acquisition implications. (Paragraph 3.81)

4.33

The Committee concludes that:

- a case exists for the Department of Veterans' Affairs to call tenders for IBM-compatible equipment, and the acquisition and support for the Australian Patient Management System to determine the level of support for the Patient Care System in the market place;

- there may be a case for the granting of a Certificate of Exemption in favour of IBM for the Concord Repatriation General Hospital computer based on the special level of support for the Patient Care System that the Department of Veterans' Affairs claim they require from IBM; and
- the decision on the method of acquisition properly rests with the Department of Local Government and Administrative Services. (Paragraph 3.82).

4.34 The Committee recommends that:

- should the Department of Local Government and Administrative Services accept the arguments put to it by the Department of Veterans' Affairs for a Certificate of Exemption for an IBM computer for Repatriation General Hospital Concord, a supply and development contract should be concurrently negotiated with IBM which ties further development and support for the Patient Care System related software to the initial IBM computer acquisition. (Paragraph 3.84).

4.35 The Committee recommends that:

- the Department of Local Government and Administrative Services investigates:
 - the legal aspects of the memorandum of understanding between IBM and the Department of Veterans' Affairs; and
 - whether the Department of Veterans' Affairs should have entered into such arrangements prior to gaining approval to proceed with the chosen method of acquisition. (Paragraph 3.87).

4.36 The Committee concludes that:

- no arguments exist for the Department of Veterans' Affairs restricting or avoiding public tendering in order that available funds be expended in 1985/86. (Paragraph 3.95).

4.37 The Committee recommends that:

- the acquisition proceed expeditiously commensurate with proper tendering practices. (Paragraph 3.96).

Costs/Benefits

4.38 The Committee concludes that:

- the cost/benefit analysis carried out by the Department of Veterans' Affairs for this project is deficient in the following general respects:
 - the Department of Veterans' Affairs has not presented its project costing data in a comprehensive and consistent manner thereby making it difficult for the Committee to reach confident conclusions about the total costs and the benefits of the proposal;
 - discrepancies exist in the cost estimates and some costs appear to have been omitted;
 - the estimated benefits appear to be conservative and were not determined for the full range of software expected to be acquired or developed;
 - other unquantified benefits will accrue to the proposal; and
 - intangible benefits, such as better health care and patient convenience, will also accrue to the project. (Paragraph 3.98).

4.39 The Committee concludes that:

- there is a lack of complete understanding of the Patient Care System on the part of the majority of Repatriation General Hospitals. (Paragraph 3.125).

4.40 The Committee recommends that:

- the Department of Veterans' Affairs take steps to maximise the gains resulting from the implementation of the Patient Care System at other Repatriation General Hospitals; and
- the Department of Veterans' Affairs make the experience, expertise and information gained at Concord readily available to other Repatriation General Hospitals. (Paragraph 3.126).

4.41 The Committee recommends that:

- the Department of Veterans' Affairs institute a cost monitoring and control system such that accurate, timely and comprehensive project costing information is readily available to the Department of Veterans' Affairs management and external regulatory authorities; and
- the Department of Veterans' Affairs report to the Department of Finance its revised estimates of the Patient Care System project cost and benefits, any subsequent change in direction of the Patient Care System project and any increase in costs or additional costs to be incurred under the auspices of this project. (Paragraph 3.131).

Estimation of CPU Capacity Requirements

4.42 The Committee concludes that:

- insufficient evidence has been supplied to enable the Committee to be assured that Repatriation General Hospital Concord and Repatriation General Hospital Heidelberg require more capacity than the base power of the 4381 range of IBM computers. (Paragraph 3.146).

4.43 The Committee recommends that:

- the Department of Veterans' Affairs supply to this Committee a chart of expected demand for computing capacity before any order is placed for a computer for both Concord and Heidelberg Repatriation General Hospitals. The chart should differentiate the expected computer capacity usage of the various hospital software modules as their usage rises over time. (Paragraph 3.147).

Location of Computer at NCC Site or RGH Sites

4.44 The Committee concludes that:

- an expanded National Computer Centre could service Repatriation General Hospitals needs on a 24 hour basis if required with only slightly reduced reliability and some slight inconvenience to Repatriation General Hospitals during periods when the computer is dedicated to data base backups. (Paragraph 3.157).

4.45 The Committee recommends that:

- the Department of Veterans' Affairs establish clear guidelines concerning the degree to which changes to the Patient Care System software can be undertaken by Repatriation General Hospital staff and the circumstances under which such changes should be attempted. (Paragraph 3.162).

4.46 The Committee concludes that:

- regular backup of the Patient Master Index and transfer of the Patient Master Index from one Repatriation General Hospital to another, provide the basis for backup arrangements in the event of extended periods when the system is not available. (Paragraph 3.170).

4.47 The Committee recommends that:

- the Department of Veterans' Affairs design its backup and recovery procedures prior to implementation and that these procedures should be tested prior to production use. (Paragraph 3.172).

4.48 The Committee concludes that:

- the argument relating to the transfer of Repatriation General Hospitals to States' hospital systems carries little weight in the centralised/decentralised computer system issue. (Paragraph 3.174).

4.49 The Committee concludes that:

- the Department of Veterans' Affairs has not seriously analysed any alternatives in its proposal;
- although a centralised option based on a National Computer Centre was dismissed on qualitative grounds, it deserved serious quantitative evaluation;
- the case for a decentralised, as opposed to centralised, strategy was insufficiently examined;
- on the evidence available it is unable to decide whether the 10-15% reduction in costs of a centralised computer system is valid or not;

- it is unable to weigh up the Department's qualitative arguments for decentralised Repatriation General Hospital computers against the potential cost savings; and
- the Department of Veterans' Affairs is not able to indicate, by effective comparison between alternatives, that its proposal is the best it can make. (Paragraph 3.178).

4.50 The Committee recommends that:

- the Department proceed with the acquisition of Repatriation General Hospital computers on the grounds that:
 - the Department is now heavily geared to the decentralised option;
 - other National Computer Centre actions are already in hand; and
 - no clear evidence exists to recommend other options. (Paragraph 3.179).

Rate of Implementation

4.51 The Committee concludes that:

- it is doubtful whether the Patient Care System team, which has yet to be fully restaffed and gain the full Patient Care System experience, will be able to affect the scheduled workload in the Draft Patient Care Project Plan. (Paragraph 3.188).

4.52 The Committee recommends that:

- the Department of Veterans' Affairs monitor achievements against the project plan closely so that when and if slippages occur, it is able to reprogram the plan early and with minimum disruption to staff training and the Department of Veterans' Affairs planning. (Paragraph 3.191).

Performance Monitoring

4.53 The Committee concludes that:

- in most instances, the quantification of benefits, resulting from computer acquisitions stating levels of variance and uncertainty, is a practicable and useful process and should be undertaken; and

- departments should be in a position to demonstrate that the benefits claimed to justify projects prior to expenditure of funds, are realised. (Paragraph 3.194).

4.54 The Committee recommends that:

- all agencies institute performance/benefit monitoring measures which will permit the continuing assessment and review of the benefits which are achieved. (Paragraph 3.196).

4.55 The Committee recommends that:

- the Department of Veterans' Affairs prepare a set of performance measures for the Patient Care System project once the initial system has been established at Concord Repatriation General Hospital; and
- the Department of Veterans' Affairs attempt to quantify in some terms benefits relating to improved health care and patient convenience. (Paragraph 3.200).

Potential Participation by Australian Software Industry in Hospital Systems

4.56 The Committee concludes that:

- there may be a substantial market for the acquisition of overseas Patient Care System software and the modification of such software to enable it to be integrated with the IBM Australian Patient Management System and to meet individual hospital requirements using Patient Care System/Applications Development System; and
- potential exists for Australian software organisations to become involved in the Patient Care System hospital market. (Paragraph 3.209).

Transfer of RGHs to States' Hospital Systems

4.57 The Committee concludes that:

- the integration of States' hospitals and Repatriation General Hospitals is expected to take at least 15 years to complete which is greater than the economic life of the equipment proposed for the Repatriation General Hospitals; but

- if integration of Repatriation General Hospitals and States' hospital systems occurs during the lifetime of the proposed equipment, neither hardware nor software which the Department of Veterans' Affairs is proposing for Repatriation General Hospitals will present any more of a difficulty for integration into States' hospitals than other possible options. (Paragraph 3.215).

APPENDIX 1

Acquisition of Computing Facilities for Installation
in the Repatriation General Hospitals,
Reference to Joint Parliamentary Committee
of Public Accounts
- Submission of 24 October 1985

DEPARTMENT OF VETERANS' AFFAIRS

ACQUISITION OF COMPUTING FACILITIES FOR
INSTALLATION IN THE REPATRIATION GENERAL HOSPITAL

REFERENCE TO

JOINT PARLIAMENTARY COMMITTEE OF PUBLIC ACCOUNTS

24 OCTOBER 1985

DEPARTMENT OF VETERANS' AFFAIRS

REFERENCE TO THE JOINT PARLIAMENTARY COMMITTEE
OF PUBLIC ACCOUNTS

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REPATRIATION HOSPITAL COMPUTING FACILITIES PROPOSAL

EXECUTIVE SUMMARY

PROPOSAL

The Department of Veterans' Affairs proposes to install medium-scale, IBM-compatible computing facilities in the five mainland Repatriation General Hospitals (RGHs).

Acquisition cost over four years of hardware, operating software and site preparation is estimated at \$10.0m. Expenditure in 1985/86 is expected to be \$2.6m of which \$2.4m will be incurred in the purchase and installation of the first of these computers at the Repatriation General Hospital, Concord, NSW.

Installation of similar IBM-compatible computers is planned for RCH Heidelberg (V) and Greenslopes (Q) in 1986/87 and Hollywood (WA) and Daw Park (SA) in 1987/88. A computing service to the RGH Hobart is to be provided by links to the Heidelberg computer.

OBJECTIVES

It is intended to provide the RGHs with reliable and responsive computing services through the installation of a standard IBM-compatible computer at each mainland RGH to improve the quality of patient care through:

- the introduction of modern, integrated management and administrative computer systems;
- servicing of hospital management information needs on a seven-day twenty-four hour operations basis;
- local responsibility for the determination and implementation of information systems.

The Department is convinced that more effective and efficient patient care services can be achieved through the introduction of advanced Hospital information systems in line with such initiatives elsewhere in Australia and overseas.

Current RGH information systems were developed fifteen years ago. Those systems are:

- obsolete and inadequate for management and medical staff needs;
- unable to be integrated into expanding hospital

2.

database developments in patient care and servicing;

the subject of complaint and criticism by user staff and the Brand Review of the Repatriation Hospital System*.

APPROACH

In 1970 the Department established its National Computer Centre (NCC) based on an IBM mainframe following a number of years of use of IBM facilities in co-operation with other social welfare Departments. The NCC supported veterans' benefits processing systems and the development of an RGH patient management system. The NCC is presently equipped with a large Amdahl 5860 (IBM-compatible) computer with a network of more than 1200 user terminals.

There is an essential need for officers at Central and Branch Offices to have access to files normally held at hospitals (and vice versa) but the inability of hospital staff to treat patients when the clinical file is at Branch Office is a major concern. This was recently commented on by both the Brand Committee and the Evatt Royal Commission.** It is proposed to pursue recommendations to extend the present central Client Data Base to incorporate clinical data needed for a complete patient profile. That profile would be available through the integrated network of NCC and RGH computers.

The Department's extensive investment in IBM-based systems, operations experience and dependence on the NCC computer-held database of client information by Offices and the RGHs dictate that the proposed computing facilities for the hospitals must be IBM-compatible.

An option considered was the expansion of the National Computer Centre facilities to meet the new systems needs of the RGHs. That option was rejected as the Department needed to ensure:

- reliable computer operations and service with minimal dependence on extended national telecommunications links;
- improved backup to computer operations through decentralised installations; and

* Review of the Repatriation Hospital System - Final Report, June 1985 - Chapter 28.

- Relevant recommendations at Attachment A

** Royal Commission on the Use and Effects of Chemical Agents on Australian Personnel in Vietnam - Vols 7&8

- Relevant recommendations at Attachment B

- the eventual transfer of each Repatriation Hospital to the State system, or otherwise as Government decides, around the end of the century.

Lack of in-depth computer operations experience in the RGHs, the need to capitalise on existing NCC expertise in IBM software and containing the growth of computer support staff in the RGHs determine that the Department must:

- acquire similar IBM-compatible facilities for each Repatriation General Hospital;
- ensure that operational procedures and software implementations are standardised and consistent with those of the National Computer Centre.

The National Computer Centre will provide central support to the RGH computer installations with operations procedures and standards, operator assistance, network management and ongoing liaison with hardware and software suppliers. Networking of NCC and RGH computers will allow for mutual backup of essential operations. The above require that facilities equivalent to the IBM 4381 computer range must be acquired for the RGHs to permit the MVS/XA operating software to be installed throughout the network.

INFORMATION SYSTEMS PROPOSALS

The Department developed in the early 1970s a major terminal-based, database linked system addressing the admission, discharge and transfer of RGH patients. That system is now obsolete and deteriorating. Its technology restricts or prevents the development and introduction of related patient care and patient service systems that should access and update the same patient and clinical databases.

It is beyond the resources of the Department and most other individual health authorities to develop a new core system for patient admissions, discharges and transfers and to produce unique information system solutions for patient services including:

- ordering laboratory services;
- reporting laboratory results to the wards;
- allied health management;
- pharmacy control and medication orders.

together with scheduling of appointments, nurse care planning and patient accounts.

DVA is convinced that the only satisfactory approach to the development of modern integrated hospital information systems lies in the use of vendor-supported applications software and system development tools.

For an established IBM user such as DVA the only available product in Australia is the IBM Patient Care System (PCS).

The basis of PCS is patient data base. The software programs to manipulate this database are of two types - an application development system (PCS/ADS) and various application modules (eg. the scheduling of outpatient appointments). DVA has had licensed use of PCS/ADS for over twelve months. The Department, with a number of other health authorities in Australia, is working with IBM on the tailoring of initial application modules to meet Australian hospital requirements.

IBM SYSTEMS SUPPORT

The Patient Care System has been progressively developed by hospitals for hospitals with IBM support and marketing. The system is in use in more than 250 hospitals worldwide. Mutual support with IBM involvement in product development is seen to be the accepted overseas approach.

In September 1984 the Department initiated the adaptation to its requirements of the U.S. Patient Management core application module of PCS. In the absence of strong local support from IBM to the health/hospitals industry, the Department relied on its own resources.

The initiative was not successful. Support from IBM was found to be essential and co-operation with other potential users most desirable. IBM has since developed a professional PCS support and development organisation and DVA has concluded that it needs its assistance.

The Department is currently working with IBM and the Royal Adelaide Hospital on the development of the base application module - the Inpatient Management System. While limited DVA resources are involved, they provide the Department with the opportunity to:

influence the system specification;

- gain considerable familiarity with the PCS/ADS language and Inpatient Management system for further enhancement to meet RGH needs;
- secure preferential implementation support from IBM;
- accept a position as national co-ordinator of Australian PCS users.

The joint development with IBM and Royal Adelaide Hospital is not conditional on the Department acquiring one or more computers from IBM for hospital installation. However, the next steps of implementing the system and linking subsequent systems to it will require a similar commitment to a joint project with the supplier of our equipment.

ACQUISITION OF FACILITIES

The Board Committee of Review Report states (para 28.26):

"Vendor support from IBM is required. DVA must ensure its interests are protected and that DVA staff have adequate involvement in any area IBM takes responsibility for..."

The Department believes that IBM is unable to guarantee applications and technical support other than normal software service to PCS users who do not operate IBM computing facilities. In view of that position and of:

- the emerging DVA commitment to PCS in six Repatriation Hospitals;
- the developing competition for IBM support services as the PCS product is adopted by a number of State authorities;
- the real risk to the achievement of project benefits without responsive IBM support;
- lack of information interchange with IBM system users (membership of the SHARE/GUIDE IBM users group and the PCS users group is offered only to users of IBM-supplied computers);
- an estimated hospital computing program cost of \$20.5m over five years*

* PCS Implementation Review by Disc International

Consultants - Report, July 1985 - page 24. the Department suggests that any marginal cost of acquiring a single IBM computer over the cost of a competitive machine is more than outweighed by the value of the expert support and information that would become available.

The Department will be strongly recommending to the procurement authority that in acquiring the computer for RGH Concord, considerable weight must be given to a tenderer's ability to support the development of hospital systems as well as the operating systems controlling the computer and communications. This would ensure:

- continued access to full PCS support;
- technical advice in PCS installation;
- expert assistance in implementation of planned new operating software implementations at the National Computer Centre.

Acquisition of the remaining four computers need not be subject to that requirement as the Department will be responsible for transferring any systems tested at the initial site.

COST EFFECTIVENESS

A primary task placed on Disc International Consultants in connection with the PCS project in mid 1985 was to advise in respect of potential five year costs and benefits.

The Consultants reported* an achievable cost/benefit ratio of 1: 1.81 with breakeven after three years.

The Department accepts those projections and believes the benefits must be vigorously pursued.

STAFF CONSULTATION

The proposal does not have an early or substantial impact on hospital staff. The initial implementation of PCS will be to replace the functions of the present admissions, discharges and transfers system.

Subsequent development of PCS will result in the location of computer terminals in ward areas and all

* Disc International - Report page 24.

centres of patient care and services. Persons with nursing administration and medical experience are being recruited to develop programs of consultation with medical and allied health services staff and to identify training and educational requirements.

Opportunities have been taken over the past twelve months to advise affected or involved staff of PCS project plans:

- the recently negotiated Memorandum of Understanding between DVA and Staff Associations on Technological Change provides a basis for formal consultation.

RISKS AND CONSTRAINTS

Acquisition of similar IBM-type computing facilities for each RGH, software-compatible with the National Computing Centre, is intended to minimise risks associated with hospital computer installation. Risk is further reduced because of the staged acquisition program with the first installation at Concord - in the same city as the NCC.

Risks and costs associated with the use of complex operating system software on the planned seven IBM-compatible computers in the DVA network (a second processor for the NCC is proposed for 1985/86) would be inevitably reduced if at least one of those computers was supplied by IBM.

If close association with IBM for PCS development and installation cannot be established immediately (as is occurring in several States):

- the Department's PCS project could have to be deferred indefinitely;
- there could be serious adverse effects on hospital management and potential user staff.

REPATRIATION HOSPITAL COMPUTING FACILITIES PROPOSAL OVERVIEW

PROPOSAL OUTLINE

The Department of Veterans' Affairs proposes to acquire medium-scale computing facilities for installation in each mainland capital Repatriation General Hospital (RGH). Over three years the purchase cost of hardware, related software and specific site preparation is estimated at \$10.0m.

The proposal was the subject of a New Policy Proposal to Government in early 1985. Cabinet agreed to the proposal and the Minister for Finance has advised his agreement, on a provisional basis, to the inclusion of \$2.6m in the 1985/86 Budget. He has directed that no expenditure should be incurred before a satisfactory report was received from the JCPA.

Installation of these computers is directed at achieving improved patient care and more efficient patient management through:

- the introduction of integrated hospital information systems and improved administrative systems;
- servicing of management information needs on a seven-day, twenty-four hour operations basis;
- local responsibility for systems determination and implementation.

Service to patients should be improved with a reduced length of stay in hospital, more efficient scheduling of treatment and diagnostic services and time-saving in admission and discharge.

For almost fifteen years the Department has used large scale IBM-compatible computers at its central bureau - the National Computer Centre (NCC), in support of benefits processing and RGH patient management:

- its data processing experience is almost exclusively IBM-related;

- its systems are developed around IBM "de facto" international standards and widely used IBM compatible languages and software products;
- the Department does not own a mainframe IBM computer and can make few demands upon IBM for expert support.
- The Department believes that the computers proposed for installation in the RGHs must also be IBM-compatible:
 - to be incorporated into the Department's network;
 - for access to shared central data bases;
 - to accept the IBM Patient Care System (PCS) software product;
 - to enable NCC resources and skills to be used in support of RGH computer operations, procedures, standards, facilities management and user training;
 - for mutual backup of essential applications with the NCC.

The Department further believes that vendor assistance in developing and implementing PCS hospital systems is vital.

It is proposed, therefore, that specification and evaluation of offers for the first hospital computer for installation in RGH Concord in 1985/86 must give considerable weight to a vendor's ability to provide this support. The remaining four IBM-compatible computers could be acquired by open tender. However, it is doubtful that a vendor other than IBM could provide the support to PCS that will be required in the longer term by each RGH.

Installation of computers at RGH Heidelberg and RGH Greenslopes is scheduled for 1986/87 and at RGH Dawn Park and RGH Hollywood in 1987/88. RGH Hobart will be serviced by communication link to RGH Heidelberg.

JUSTIFICATION

Computing needs of the hospitals are barely met by a range of discrete systems based on the Department's

central computer bureau in Sydney, on local mini-computers in the larger hospitals and on a variety of micro-computers.

Such facilities do not permit an integrated approach to the information needs associated with patient care or to effective resource management. The primary hospital system in use is the Admissions, Discharges and Transfers system (ADT) for patient management. This was developed by the Department for RGH Concord in the early 1970's. It has been progressively modified and extended to the other RGH's. While once a satisfactory system for the tracing of a patient from the time when admission is proposed until after discharge, it is now obsolete, the subject of extensive criticism (Brand Committee of Review - chapter 28 refers) and fails to provide the basis for integrated systems development.

The ADT system is implemented through the Department's National Computer Centre in Sydney. The NCC cannot economically provide a seven-day twenty-four hour service to the hospitals. Reduced levels of service are provided after midnight and at weekends.

RGH computing service needs may be summarised as:

- responsive and reliable processing arrangements under local control;
- a basis for the development and integration of advanced hospital systems and the growing number of patient-related data bases now evident in each RGH;
- continued linkage to the central data base of veterans' details maintained at the NCC in support of the full range of services provided to veterans.

Central and Branch Offices and the RGHs must have access to the central veteran Client Data Base held at the National Computer Centre (NCC) and to the clinical files held at the hospitals. The inability of hospital staff to treat patients when the clinical file is at Branch Office is a major concern. Incorporation of clinical data into the computer-held Client Data Base, as recommended by the Brand Committee and the Evatt Royal Commission (Attachment A and B refers), is being pursued.

Considerations of managing a network of computers in an environment encompassing the creation, storage and retrieval, transfer and integration of data, text, facsimile copies and digitised images dictate that the major computing facilities in the network must be IBM-compatible.

At the individual hospitals this master register of patients is the core of an extensive range of systems modules which are dependent on the core data but include additional data which could in turn be shared with other modules in a total integrated Hospital Information System (HIS).

A survey of integrated HIS products available on IBM compatible equipment led to the selection of the Patient Care System (PCS) from IBM and the acquisition of the core module.

Experience to date in the amendment of that package to meet unique DVA requirements has proved that the success of further work to modify subsequent modules and ensure their interconnection cannot be assured without vendor support. This support is additional to the normal servicing of a software package such as PCS.

This proposal for IBM-compatible facilities in each mainland capital RCH addresses each of the above needs. The primary justification, however, flows from the opportunity presented for the introduction of a new patient care system as the replacement for the current Admissions, Discharges and Transfer system and as the basis for rapid hospital information system expansion.

PATIENT CARE SYSTEM

The existing ADT system was developed by the Department and is unique to the RCHs. The task of developing a new, replacement system is well beyond the Department's systems resources and could not be accomplished in an acceptable timeframe. Hospitals worldwide have turned to commercially available applications software as the basis for advanced hospital information systems. This approach is also becoming well established in Australian hospitals.

Product development and implementation support by the software supplier are essential. DVA has been reviewing the availability of integrated hospital systems since 1981. Systems need to be:

- based on "user-friendly" technology;
- developed for IBM or IBM-compatible computers;
- supported in Australia by an experienced organisation;
- in widespread use to ensure continued development and the availability of all required elements of a hospital information system through co-operative ventures.

The IBM Patient Care System (PCS) is the only system known to meet these criteria. Information systems based on PCS are in use in over 250 hospitals overseas. Tailoring of PCS to the Australian environment is, however, a major task and beyond the limited systems resources of most hospital authorities. DVA attempted such unilateral PCS redevelopment in 1984/85.

To validate its decision to adopt the IBM Patient Care System, assist in project management and review the cost effectiveness of the PCS approach, the Department arranged a consultancy by Disc International in May 1985.

While measures of benefit from improved hospital systems are poorly developed in Australia, the consultancy related overseas experience to the RCHs and documented achievable, positive benefits from the implementation of PCS on the IBM-compatible mainframe computers proposed for acquisition. The Disc International Consultants' Report is attached.

In its review of the Repatriation Hospital system, the Board Committee (Chapter 28) summarised its review of the application of ADP within the RCHs. While critical of aspects of PCS project planning, the Committee effectively supported the Department in its intended use of PCS.

The Repatriation Commission has considered in detail the Committee's recommendations on the PCS project. Its position in regard to major recommendations is at Attachment A.

The Department's adoption of the Patient Care System necessitates a close working relationship with IBM. Similarly, IBM needs to work with hospitals in Australia

to tailor the overseas PCS application modules. DVA has joined other Health Authorities in a joint development arrangement with IBM to:

- influence the specification of the PCS system to minimise subsequent in-house modification;
- develop expertise in the use and understanding of PCS to reduce future dependence on IBM;
- achieve earliest possible system implementation and preferential IBM support arrangements;
- reduce implementation risk through a close working relationship with IBM and other hospitals working to use PCS.

A formal arrangement covering PCS Joint Development of the basic design tasks would be completed with IBM with interim arrangements the subject of a Memorandum of Understanding.

A Joint Development with IBM has real advantages for DVA. This is confirmed by the PCS Consultants in Sections 3 and 4 of their report and the Brand Committee (Para 28-26). DVA has already influenced the design of the core module and data base structure of PCS and will benefit from the changes to the U.S. developed applications package. However, the Department does not expect to receive essential support to extend the scope of the PCS system unless it acquires an IBM mainframe computer.

CORPORATE PLAN - SUMMARY

The Department of Veterans' Affairs was established to "care for people who have served in the defence of Australia". The Department strives to provide entitled veterans and their dependants with:

- health care and services and home care at a level commensurate with Australian community standards;
- income support and other allowances as authorised.

The Repatriation General Hospitals' first priority is to provide treatment for entitled veterans and their dependants and for serving members of the Armed Forces and for community patients where spare capacity is available.

Hospital services are a component of the Department's Health and Welfare Services Program with the objectives of:

- providing comprehensive and cost-effective diagnostic and treatment services;
- providing for the teaching of medical, nursing and allied health personnel;
- actively encouraging and supporting medical, scientific and general health service research.

(Reference to the DVA ADP Strategic Plan 1985/86 - Section 2 will provide an overview of major Departmental programs and program objectives).

The Minister's concerns in regard to the lack of provision of resources in the Repatriation hospitals to ensure the best possible quality of service for veterans led to the commissioning of the Brand Committee of Review with Terms of Reference as follows:

- Identify deficiencies in resources (buildings, equipment and staff) and administrative procedures which inhibit the hospitals from delivering a high quality of care with efficiency and convenience to patients;
- Identify the requirements for the further development of the hospitals and related services to an ageing Veteran population to the end of the next decade;
- Make recommendations (including on funding) to correct any such deficiencies and to meet those requirements.

Recommendations of the Committee are wide-ranging. They are the basis for submissions to Government in regard to resource requirements and the future role of the Repatriation hospital system.

ADP OBJECTIVES

The ADP Objectives of the Repatriation hospitals cannot be divorced from those of the Department as a whole. Those objectives are detailed in the ADP Strategic Plan 1985/86.

ADP STRATEGIC PLAN

The Department's ADP Strategic Plan for 1985/86 has been previously provided to the Committee's secretariat.

This computer acquisition proposal is fully in accord with the Plan (Sections 8.2 - 8.4 specifically refer). The Plan highlights:

- the relationship of hospital information systems planning to other DVA systems proposals (Section 5 refers);
- the relevance of Departmental ADP policies, plans and methodologies to all systems activity, including that at hospitals.

Comments on the ADP Strategic Plan by the Public Service Board and the Department of Local Government and Administrative Services are expected shortly.

REVIEW OF EXISTING HOSPITAL INFORMATION SYSTEMS

Existing hospital systems may be categorised as being related to either

- Patient Care;
- Patient Services; or
- Resource Management.

Patient Care. The Admissions, Discharges and Transfers system has been progressively extended from its initial implementation in RGH Concord in the early 1970's to all RGHs. It is a first generation on-line, data base system characterised by:

- complex visual display terminal operations and poor screen design;
- inadequate support and documentation at this stage of its life;
- difficulty and risk associated with changes or enhancements;
- obsolete design restricting links and integration with a range of supplementary patient care system requirements and shared data bases.

There is a high level of user dissatisfaction with the system, its batch reporting processes and unavailability on a seven-day, twenty-four hour basis.

The system is centred on the Department's National Computer Centre in Sydney which is predominantly used for benefits processing systems. Some 190 VDUs are located in the RGHs in support of the ADT system. That represents less than one-third of the potential demand for access to a responsive patient care system.

There are few system support staff and little remaining experience from the original systems development. The more recent development of minor supplementary systems for the management of Infection control, Dietary Services and Nursing Workloads has demonstrated the impracticality of now extending the ADT system. Those new systems have been largely rejected by users with expectations well in advance of the computing technology available.

Patient Services. In the absence of mainframe facilities in the RGHs and a responsive service to hospitals from the NCC, micro computer systems have been growing. Individual data bases have been established in laboratories, pharmacies and allied health service areas with little opportunity to share data or maintain compatibility.

The proposed mainframe installation will be a catalyst for the implementation and maintenance of systems standards, will provide extracts of patient data in support of requests for services and its data base will be updated with service results.

Significant mini-computer based systems are installed in support of biochemical analysis - standardised systems are in place in RGHs Concord, Heidelberg and Greenslopes. Similar systems are proposed for haematology laboratories in several of the hospitals.

Resource Management. A stores inventory and accounting system is implemented on PRIME minicomputers in RGHs Concord, Heidelberg and Greenslopes. This standardised system uses commercial applications software and services users through up to 30 visual display terminals in each hospital.

Extension of the system to other RGHs has been deferred until the proposed IBM-compatible computers are installed.

Summary. The implementation of information systems in the RGHs has been restricted severely by resources and funds in recent years. The opportunity to extend systems development to address patient care and services effectively and efficiently has been limited in the absence of:

- local hospital mainframe computing facilities under the control of RGH management;
- developments, data base and systems development technology, such as are available through the PCS product;
- a clear understanding of RGH hospital information flows, systems requirements and priorities;
- the Brand Committee noted (para 28.1) that complaints were received from every RGH about their ADP systems and service:

"With the very high degree of dissatisfaction expressed about this service, the Review believes it is imperative that a major overhaul be conducted of the direction computer applications are going within the RGHs as a matter of urgency".

A consultant's validation of the strategy for satisfying hospital information systems needs and priorities will be undertaken during 1985/86. Consultants will be retained to lead this review which must consult with hospital staff at all levels:

- the realisation of strategies for hospital mainframe computing facilities and the PCS software will lend substance to users' statements of need.

There has been no recent review by the Auditor-General or Internal Audit of existing hospital systems.

OPTIONS CONSIDERED

The Repatriation Hospitals will most likely be absorbed into the various hospital systems of the States by the end of the century.

Initial discussions have been held with State hospital information systems planning staff. Initiatives are underway in all States to introduce advanced, on-line database systems:

the DVA decision to adopt PCS is consistent with that planning in several States;

- DVA must adopt a standard approach nationally for reasons of economy although IBM compatibility and PCS may not accord with the computer supplier standardisation strategy of certain State authorities;
- the use of State health computing facilities is not an option in the short-term.

The principal option available to the Department as an alternative to the current proposal is a central bureau approach, possibly through an expanded National Computer Centre. That option has been rejected on the following grounds:

- a national bureau is presently used:
 - it is the subject of increasing comment in regard to responsiveness, service levels and reduced local responsibility for computer services;
- more reliable operations on a twenty-four hour basis are achievable if organised locally;
- improved levels of backup can be achieved through decentralised installations;
- the eventual transfer of each RGH to a State system would necessitate the eventual closure of the central service.

The program of computer acquisitions is designed to accommodate the likely availability of financial resources, human resources available for computing facilities implementation, and to provide for progressive project review.

COST EFFECTIVENESS

Surveys have revealed that limited, detailed information is available on the benefits associated with the introduction of integrated hospital information systems, such as PCS, into Australian hospitals.

The Disc International Consultancy on PCS was required to review available overseas information, to consult with RGH managements and to provide:

"an estimate of perceived five year costs and benefits for the implementation of PMS (ie Inpatient Management module) and subsequent modules of PCS in the RGHs."

Section 5 of the Consultant's Report refers. The Consultant concludes that benefits in dollar terms of \$37.1m are achievable over five years with anticipated costs of \$20.5m. Break even after three years was indicated.

The benefits survey contained in the Report highlights the different perceptions of benefit from PCS in different RGHs. The pressures facing each RGH may be unique and different management styles and methodologies are evident.

The benefit survey has produced results of greater substance than the benefit arguments revealed to the Department by State health authorities. The measures are capable of finer definition and achievement can be monitored.

Cost effectiveness projections by Disc International have been accepted by the Department as support for this hospital computing proposal.

POLICY CONSTRAINTS

The proposal is not seen to be influenced or restricted by Government policy considerations other than those relating to the procurement of ADP equipment.

ACTION PLAN

The following major steps in computer acquisition and initial PCS implementation have been scheduled:

November 1985

- Reference to JPCPA;
- Request to DOLGAS to arrange acquisition of a computer of the capability of an IBM 4381.

December 1985

- Conclusion of arrangements with IBM for pilot implementation of the

Inpatient Management module of PCS at Concord January - March 1986. Interim use will be made of the IBM computer operated by Department of Housing and Construction;

- Request to DOLGAS to call open tenders for four IBM 4381 equivalent computers for delivery in 1986/87 and 1987/88;
- Specification of DVA requirements for Outpatient Appointment Scheduling module of PCS;

April 1986

- Installation of IBM 4381 type computer at RGH Concord;
- Joint development with IBM of Outpatient Appointment Scheduling;

May 1986

- Implementation of Inpatient Management module at RGH Concord on hospital computer;
- Initial implementations of Appointment Scheduling module.

July 1986

- Installation of IBM 4381 type computer at RGH Heidelberg;
- Implementation of Inpatient Management module.

September - November 1986

- Installation of IBM 4381 type computer at RGH Greenslopes;
- Implementation of Inpatient Management module.

July - September 1987

- Installation of IBM 4381 type computers at RGHs Daw Park and Hollywood.

Implementation of PCS modules at Daw Park and Hollywood will be dependent on:

- achievement of PCS implementation at other RGHs;
- capability and capacity of other RGHs to provide PCS computing services via telecommunications links ahead of the installation of their own facilities;
- potential co-operative arrangements with State Health authorities regarding PCS introduction.

INDUSTRIAL ISSUES

Consultation arrangements for the introduction of technological change are outlined at Section 6 of the Department's ADP Strategic Plan 1985/86.

A Memorandum of Understanding between DVA and Staff Associations in relation to consultation on technological change has recently been agreed (Attachment C). The consultation procedures contained therein are being implemented in regard to the computer acquisition proposal and PCS implementation.

A program of informal presentations to hospital staff on PCS objectives and progress has been initiated. The program recognises:

- the previous lack of progress in meeting RGH user expectations of system improvements and computing facilities installation;
- the first stage of PCS implementation involves the replacement of the current Admissions and Discharges system with limited impact on system users.

PCS staff recruitment is now focusing on nursing administration and paramedical/allied health experience. A priority task will be the development by such staff, in consultation with IBM and other PCS users (eg. Royal Adelaide Hospital), of programs of consultation, education and training for the extension of PCS applications beyond the initial Admissions and Discharge function.

AUSTRALIAN INDUSTRY PARTICIPATION

The proposed computer acquisition program will be subject to Government policies and procedures in regard to Australian Industry Participation as stipulated by the

procurement authority, the Department of Local Government and Administrative Services.

There are indications of very substantial investment by IBM in PCS-related hospital systems developments in Australia.

CONSULTATION COMMENTS

The proposed strategy for hospital information systems including computer acquisitions is developed in the DVA ADP Strategic Plan 1985/86.

In the submissions to Government in respect of the hospital computing proposal, the co-ordinating comments of the Department of Finance, DOLGAS and PSB were generally favourable.

The Minister for Finance has advised, however, that 1985/86 funding of \$2.6m is provisional - no expenditure should be incurred before a satisfactory report has been received from the JPCPA and the JPCPA reference needs to address the comments of the Brand Committee (Attachment A refers).

CONSEQUENCE OF NOT PROCEEDING

The computer acquisition and Patient Care system implementation proposal results from the Department's need to provide each RGH with:

- modern, integrated management and administrative computer systems;
- local responsibility for systems determination and implementation;
- the management of information processing on a seven-day, twenty-four hour basis.

The Department does not have sufficient computing capacity at its National Computing Centre to accommodate the PCS system developments.

The existing patient management system is obsolescent and does not meet the reasonable expectations of hospital management in regard to:

- on-line availability on a twenty-four hour basis;

- ease of use and flexibility to meet changes to information requirements;
- integration with other hospital developments concerned with the same client base.

If the Patient Care project does not proceed the present opportunity will be lost to improve the quality of patient care and treatment, including an expected reduction in length of patient stay in hospital, introduce more efficient scheduling of patient services and reduce the time and effort associated with patient admission and discharge. The Department would also lose the opportunity to:

- achieve significant dollar benefits through improved information systems (Disc International Consultant's Report - Section 5);
- co-operate with a number of other Australian and overseas hospitals in the development, adaption or specification of common systems solutions;
- demonstrate a commitment to improved patient care and servicing through the application of modern information technology.

Resources do not exist within the Department to undertake unique hospital systems development:

- this has led to the stagnation of the current patient management system;
- it is not cost effective to undertake complex systems development on behalf of only six hospitals.

ADVANCED TECHNOLOGY CONSIDERATIONS

The proposal is based on the use of proven computer technology:

- available hardware is proven and compatible with that in use at the Department's National Computer Centre (NCC);
- operating software is to be compatible with that installed or to be installed at the NCC;
- operating procedures will be developed and supervised by experienced NCC staff;

the Patient Care System is in world-wide use in over 250 hospitals and is being adopted by a number of Australian hospitals:

- the Department has positioned itself to secure pre-implementation experience with the PCS product, the capability to tailor it to suit precise needs of the RGHa and to secure preferential product and implementation support;
- a significant risk to successful PCS implementation would exist if the support of IBM was not secured (Brand Committee of Review supports this view - para 28.26);
- acquisition of facilities and system implementation are phased;
- the option would exist to defer or reschedule PCS system or module implementation at any site.

CHAPTER 6 - Preliminary Remarks

5. Recommendation:

(i) THAT EFFECTIVE RATIONALISATION TAKE PLACE BETWEEN THE REPATRIATION HOSPITAL SYSTEM AND THE STATE HOSPITAL SYSTEMS (para 6.5).

Responsible area: Treatment Services Division

Action required: Commission accepted principle. To be implemented as soon as possible. Principle to be incorporated in draft Cabinet submission
Commonwealth/State consultation
Consultation with Staff Associations

Target Date: Immediate - September 1985 (Cabinet Submission)

Resource Implications: Non-Departmental hospital expenditure

Comment:

6. Recommendation:

(ii) THAT DEPARTMENTAL AND STATE PLANNING FOR HEALTH SERVICES REFLECT RECOGNITION OF THE INEVITABILITY OF ULTIMATE INTEGRATION OF THE TWO SYSTEMS (para 6.5 and 6.12 to 6.15).

Responsible area: Treatment Services Division

Action required: Commission could not accept that integration was inevitable given the possibility of future conflicts, the need for facilities for Defence Force personnel and other possible future Commonwealth policies.

Refined proposal to be incorporated in draft Cabinet submission.
Commonwealth/State consultation
Consultation with Staff Associations.

Target Date: Immediate - September 1985 (Cabinet Submission)

Resource Implications: Non-Departmental hospital expenditure

Comment:

CHAPTER 7 - Changes in the Treatment Population

15. Recommendation:

(ii) THAT AN ANNUAL STATEMENT OF POPULATION PROJECTIONS FOR USE IN STRATEGIC PLANNING BE PREPARED AND PUBLISHED (para 7.13).

Responsible area: Systems Division

Action required: Commission agreed to recommendations but noted that the Department could not employ "actuaries".

Target Date: Short-term - December 1985

Resource Implications: 2 or 3 extra staff

Comment: Efforts are already being made to divert from routine reporting to predictive analysis.

16. Recommendation:

(iii) THAT THE DEPARTMENT'S CENTRAL PLANNING UNIT HAVE ACCESS TO SKILLED ADVICE IN BIOSTATISTICS AND CLINICAL EPIDEMIOLOGY (para 7.14).

Responsible area: Systems Division - consult with Medical

Action required: Commission accepted recommendation.

Target Date: Short-term - December 1985

Resource Implications: Minimal

Comment:

CHAPTER 15 - Medical Records Services

79. Recommendation:

(v) THAT THE DEPARTMENT INITIATE A COMPLETE COMPUTERISED PATIENT MASTER INDEX IN THE HOSPITALS (para 15.17).

Responsible area: Systems Division

Action required: Commission accepted recommendation and noted that it was the first stage of PCS implementation.

Target Date: Short-term - December 1985

Resource Implications: To be advised

Comment: Project began in September 1984. Joint development with Royal Adelaide hospital began May 1985

80. Recommendation:

(vi) THAT THE DEPARTMENT INTRODUCE AN AUSTRALIA WIDE NUMBERING SYSTEM UNIQUE TO EACH INDIVIDUAL PERSON (para 15.19).

Responsible area: Systems Division

Action required: Commission accepted the recommendation as a long-term strategy but noted significant resource implications. The rationalisation of other identifiers is being considered as new systems are proposed. Status report to Commission

Target Date: Short-term - December 1985 (Status report)

Resource Implications: Significant

Comment:

81. Recommendation:

(vii) THAT THE USE OF A COMPUTERISED PATIENT PROFILE RECORD BE INVESTIGATED (para 15.25).

Responsible area: Systems Division

Action required: Commission agreed to recommendation. For consideration when hospital computing and word processing facilities are installed. Status report to Commission

Target Date: Long-term - June 1986 (Status report)

Resource Implications: To be advised

Comments:

82. Recommendation:

(viii) THAT AN UP-TO-DATE, 24 HOUR BACK UP SERVICE TO THE COMPUTERISED FILE LOCATION BE ORGANISED (para 15.26).

Responsible area: Systems Division

Action required: Commission rejected recommendation and noted that the problem had largely been overcome by the recent purchase of additional storage capacity. Need to replace existing microfilm back-up system will be prioritised against other system demands by PCS Steering Committee. Status report to Commission

Target Date: Short-term - December 1985 (Status report)

Resource Implications: To be advised

Comments:

87. Recommendation:

(xiii) THAT WORD PROCESSORS BE ACQUIRED AS A MATTER OF URGENCY IN AREAS RESPONSIBLE FOR DISCHARGE SUMMARIES, AND THAT ERGONOMICALLY DESIGNED EQUIPMENT AND FURNITURE BE ACQUIRED TO SUPPORT THIS (para 15.37).

Responsible area: Systems Division

Action required: Implemented - Commission noted that implementation was in progress.

Target Date:

Resource Implications: Office Machines, furniture and fittings

Comment: Endorsement of established DVA strategy. Equipment to provide access to common storage with facilities to index and retrieve as well as process text was acquired in June 1985

CHAPTER 17 - Outpatient Services and Elective Admissions

109. Recommendation:

(iv) THAT THE CLERICAL AND TYPING SYSTEMS AND PROCEDURES IN THE OUTPATIENT DEPARTMENT BE STREAMLINED TO IMPROVE THE PRODUCTIVITY AND EFFICIENCY OF THE DEPARTMENT (para 17.7 and 17.8).

Responsible area: Management Services Division

Action required: Commission agreed to recommendation. Management Review to be undertaken. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Possible savings

Comment:

110. Recommendation:

(v) THAT THE TYPING ARRANGEMENTS FOR OUTPATIENTS BE UPGRADED WITH THE USE OF WORD PROCESSING FACILITIES (para 17.11).

Responsible area: Systems Division

Action required: Commission agreed to recommendation being pursued in the 1986/87 Budget and noted the significant resource implications. Equipment acquired in June 1985 to be fully utilised, developed and evaluated. Status report to Commission

Target Date: Long-term - June 1986

Resource Implications: Equipment cost

Comment:

111. Recommendation:

(vi) THAT A COMPUTERISED OUTPATIENT SCHEDULING SYSTEM BE IMPLEMENTED (para 17.11 and Chapter 28).

Responsible area: Systems Division

Action required: Commission agreed to recommendation and noted the need to evaluate the Victorian system and extend the system to other States. System to be accessible to users on the hospital network. -- Status report to Commission

Target Date: Long-term - June 1986

Resource Implications: Cost of implementation. Possible savings in staff numbers

Comment:

CHAPTER 26 - Personnel Services

168. Recommendation:

(iii) THAT THE DEPARTMENT CLOSELY INVESTIGATE COMPUTERISED PERSONNEL PAYROLL SYSTEMS WITH A VIEW TO IMPLEMENTING AN ALL-ENCOMPASSING SYSTEM FOR THE HOSPITALS (para 26.37).

Responsible area: Systems Division

Action required: Commission noted this was part of the Personnel Management System review. Priority in relation to other systems to be established. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Scope for staff savings

Comment:

CHAPTER 28 - Automated Data Processing

178. Recommendation:

(i) THAT A STUDY BE UNDERTAKEN BY AN INDEPENDENT BODY IN CONSULTATION WITH THE HOSPITALS OF THE FULL DATA PROCESSING REQUIREMENTS OF THE HOSPITALS AND HOW BEST TO SUPPLY THOSE REQUIREMENTS (para 28.2 and 28.4).

Responsible area: Systems Division.

Action required: Commission agreed with this recommendation noting it has been implemented. Continue to develop total DVA strategy. Status report to Commission.

Target Date: Long-term - June 1986

Resource Implications: Significant costs in consultancy fees

Comment: The first of these consultancies began in June 1985.

179. Recommendation:

(ii) THAT A HOSPITAL COMPUTING STEERING COMMITTEE BE SET UP IN EACH RGH (para 28.5).

Responsible area: Systems Division.

Action required: Commission agreed with recommendation. Implemented

Target Date:

Resource Implications: Minimal

Comment:

180. Recommendation:

(iii) THAT A HOSPITAL INFORMATION SYSTEM CO-ORDINATOR BE APPOINTED AT EACH RGH (para 28.6).

Responsible area: Systems Division

Action required: Commission agreed and noted the recommendation was implemented.

Target Date:

Resource Implications: 1 staff at each RGH

Comment:

181. Recommendation:

(iv) THAT THERE BE HOSPITAL REPRESENTATION AT ANY BRANCH OR CENTRAL OFFICE STEERING COMMITTEE (para 28.7).

Responsible area: Systems Division.

Action required: Commission agreed with the recommendation. Consult with Chairman of CO. Steering Committee. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Travel expenses

Comment:

182. Recommendation:

(v) THAT CENTRAL OFFICE DATA PROCESSING STAFF BECOME PERSONALLY ACQUAINTED WITH THE HOSPITAL ENVIRONMENT AND USER REQUIREMENTS (para 28.8).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation. Team members to continue visits to RGH's. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Travel expenditure

Comment:

183. Recommendation:

(vi) THAT ONLY QUALIFIED PERSONS BE APPOINTED IN ADP SECTIONS OF THE HOSPITALS (para 28.13).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation. Situation to be reviewed. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Nil

Comment: There has been a lack of strategic direction in the use of microcomputers which is being addressed by the establishment of a central group to support Branch and hospital staff in this area. The systems staff at hospitals and Branch Offices will be trained to support users in the full range of applications.

184. Recommendation:

(vii) THAT A QUALIFIED PROJECT MANAGER BE OBTAINED FROM OUTSIDE DVA TO HEAD THE PCS TEAM (para 28.24).

Responsible area: Systems Division

Action required: Commission rejected this recommendation.

Target Date:

Resource Implications:

Comment: A response to a job specification for the Project Manager was sought from an external consultant but the cost (\$250,000) was not able to be justified. A senior Departmental officer will be seconded in August to manage the project.

185. Recommendation:

(viii) THAT A MEDICALLY QUALIFIED PERSON BE APPOINTED AS PART OF THE PCS TEAM TO ENSURE THE QUALITY OF THE SYSTEM FUNCTION AND TO PROTECT THE USERS' INTERESTS (para 28.24).

Responsible area: Systems Division

Action required: Commission agreed that special interest groups be formed. Consultation with Medical. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Minimal staffing

Comment:

186. Recommendation:

(ix) THAT MAJOR AUTOMATED DATA PROCESSING STRATEGIES BE DEFINED AND RATIFIED (para 28.25).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation and noted it had been implemented. Definition and ratification to be continued. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications: Minimal

Comment:

187. Recommendation:

(x) THAT AN ADEQUATE BUDGET FOR THE PCS PROJECT TEAM BE PROVIDED AND THAT THE PROJECT MANAGER HAVE CONTROL OF THE BUDGET AND PROJECT (para 28.27).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation and noted it had been implemented under the supervision of a Steering Committee.

Target Date:

Resource Implications:

Comment:

188. Recommendation:

(xi) THAT STAFFING FOR THE PCS PROJECT BE TIMELY AND ADEQUATE (para 28.28).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation and noted it was in progress. Continue recruitment. Status report to Commission.

Target Date: Short-term - December 1985

Resource Implications:

Comment: Recruitment in progress

189. Recommendation:

(xii) THAT THE HOSPITAL COMPUTER STEERING COMMITTEES IN CONJUNCTION WITH CENTRAL OFFICE DEVELOP POLICIES IN RELATION TO PERSONAL COMPUTERS (para 28.30).

Responsible area: Systems Division

Action required: Commission agreed with the recommendation and noted it was being implemented. Policies to be developed. Report for Commission consideration

Target Date: Short-term - December 1985

Resource Implications: Nil

Comment:

190. Recommendation:

(xiii) THAT A RETRAINING PROGRAMME BE IMPLEMENTED FOR VDU OPERATORS (para 28.31).

Responsible area: Systems Division

Action required: Commission agreed that a retraining program be implemented as needs are identified. Strategies to be developed by Staff Development. Status report to Commission

Target Date: Short-term - December 1985

Resource Implications: Expenditure to conduct program

Comment: Action will be initiated as specific needs are identified and advised

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seek such specialist opinions only when necessary for the purpose of assisting claim determination or when considered medically necessary.

19. THAT medical assessments identifying degrees of incapacity be made by medical officers at the same time as diagnostic medical examinations are conducted wherever possible.

20. THAT an intra-departmental committee reporting to the Secretary to the Department be established to consider the number of Repatriation Commission decisions reversed on appeal, the reasons therefore, and the need to amend administrative practices or procedures in the light of such results;

21. THAT funds be provided to enable DVA to transfer clinical record files of Vietnam veterans to computer files. This would enable all hospitals in the Repatriation system to have immediate and continuous access to all clinical records while enabling other administrative actions to proceed or continue. Administration and treatment should be complementary and not competing priorities within DVA. The computerisation of all relevant records would facilitate that end. This is a most important recommendation. The Commission

has perceived its own inquiries creating delays because of the need to sight the files.

The Commission respectfully suggests that the computerisation process referred to in Recommendation 21 above be extended to the clinical files of all DVA clientele.

The Commission is acutely aware of the expense of computerisation of clinical files. It regards this step as urgent and perceives it as in large measure solving complaints about information supply, delay and counter staff.

CHAPTER XV Conclusions and Recommendations

1. The Commission recommends the adoption of its program for publicity of its findings set out in the postscript.

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DRAFT

MEMORANDUM OF UNDERSTANDING BETWEEN DVA AND STAFF ASSOCIATIONS IN RELATION TO CONSULTATION ON TECHNOLOGICAL CHANGE IN THE DEPARTMENT

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ATTACHMENT A

STAFF IMPACT DOCUMENT

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MEMORANDUM OF UNDERSTANDING BETWEEN DVA AND STAFF ASSOCIATIONS IN RELATION TO CONSULTATION ON TECHNOLOGICAL CHANGE IN THE DEPARTMENT

PURPOSE

1.1 The purpose of this memorandum is to set out jointly agreed arrangements for:

- consultation between Staff Associations and the Department regarding technological change within the Department;
- the principles which underline the agreement to consult; and
- describing the nature and timing of the flow of information between the Department and the staff associations involved in these arrangements.

DEFINITIONS

2.1 Throughout this memorandum there will be a requirement to ensure clarity by defining key or ambiguous terms. These definitions will generally be covered in the body of this Memorandum. Three terms which require immediate definition are:-

- 'Department'. The Department of Veterans' Affairs.
- 'Staff Association'. A legally constituted Association or Union whose members are employed within the Department.
- 'Technological Change' is defined as involving the introduction of new equipment, including computer based equipment, which effects the efficiency and effectiveness of the operations of the Department, the employment of persons to whom this memorandum applies, or the way in which the work is performed. This definition also includes significant variations to existing systems, software as well as hardware, and trials of possible systems or technologies, where these affect the operations of the Department or involve changes to the structure of work or the working environment.

OBJECTIVES OF TECHNOLOGICAL CHANGE

3.1 The objectives of the continuing introduction of new technology are twofold:

- to assist the Department to efficiently and effectively achieve its corporate objectives with regard to:
 - time, quality and cost of services to the clients.

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- utilisation of resources.
- thorough scrutiny of practicable alternatives to satisfy the needs of Government, its clients and the Australian community
- to improve the working environment for employees, including:
 - ensuring the benefits of the development of new technology are available to them to reduce tedious activities, increase job satisfaction, impart new skills and improve job design;
 - improving and securing career paths and classifications while at the same time increasing job mobility;
 - whenever possible, decentralising decision making and giving increased autonomy and responsibility to staff.

4. CONCEPT OF TECHNOLOGICAL CHANGE

4.1 Technological change is a broad concept involving changes in equipment, including machinery, specialised hospital equipment and computer-based equipment, which affects the way in which work is performed and the efficiency and effectiveness of the Department's operations. New technology may also require the development of new or very different work methods or operations which in turn may lead to elimination of certain jobs or possible occupations, and substantial changes for individuals involved in the work areas in question. Conversely, technological change may also serve to broaden and secure career paths and classifications, to increase job satisfaction, task variety and staff mobility, to improve skill levels, numbers of staff and job opportunities and to create a healthier and safer working environment.

4.2 Accordingly, assessment of technological change proposals must have regard to both positive and adverse effects and it is accepted by the parties that these assessments will be given joint consideration.

5. BROAD PRINCIPLES OF CONSULTATION

5.1 For the purpose of this Memorandum it is agreed that the important broad principles in consultation are as follows:

5.2 The Department acknowledges the Staff Associations' need to be advised of projects falling within the terms of this Memorandum of Understanding. It therefore agrees to provide written details of projects clearly falling within these guidelines together with lists of proposals

identified in the ADP strategic plan, the register of system and review proposals and the national register of specialised equipment programme. The Staff Associations undertake to respond quickly indicating on which projects they wish to consult and the level of that consultation.

- 5.3 Consultation should serve to ensure that all staff are made aware of the industrial and environmental benefits and disadvantages which may accrue from technological change. Where the Department and Staff Associations have not reached agreement on an issue/aspect of technological change, this will be acknowledged in any information provided to staff.
- 5.4 Consultation acknowledges the responsibility of the Department to provide information to Staff Associations before the development and implementation stages of technological change, and to take into account and respond to any Staff Associations' proposal that the change be amended, or not implemented, or for alternative non-technical solutions or timetables.
- 5.5 Consultation should serve to ensure that the concerns of staff regarding technological change are recognised and that all possible action is taken to minimize any detrimental effects of such change. It is agreed that Staff Association will be consulted regarding any redesign of jobs.
- 5.6 Every effort should be made to ensure that concerns about technological change are addressed with minimum disruption to the delivery of benefits resulting from the proposed change.
- 5.7 Staff Associations acknowledge that an objective of the consultative process is to produce an environment in which industrial action should be unnecessary and agree that only issues of relevance to particular projects will be raised.
- 5.8 As part of the consultative process, the Department shall provide to Staff Associations at all stages, all available relevant information required to make adequate assessments of the ramifications of the proposed technological change. Adequate time will be given to Staff Associations for consideration of proposals including, in the case of members who are affected, the opportunity for proposals to be considered in worktime.
- 5.9 Where Government decisions require it, or as agreed, the procedures for consultation may be abbreviated by agreement reached between the Department and the Staff Associations.
- 5.10 Following notification of a proposal Staff Associations agree to respond within a reasonable period.
- 5.11 Consultation should follow and observe the established and mutually agreed processes and communication channels.

12 The Department shall provide to key management personnel copies of these arrangements and inform them that they are Departmental policy in situations where technological change is contemplated.

6. PRINCIPLES OF IMPLEMENTATION OF NEW TECHNOLOGY

6.1 The following principles are agreed:-

6.2 Training and re-training of staff shall be at management expense.

6.3 Prior and subsequent training shall be provided to staff required to use new technology in their jobs and adequate resources shall be provided to cover the provision or receipt of training.

6.4 The Department notes the view of Staff Associations that all necessary transfers should be voluntary. The Department agrees that, should it be necessary to transfer staff compulsorily, the Department will consult with the relevant Staff Association(s).

6.5 Technological changes shall not result in discrimination against members of EEO designated groups. Any such concerns arising out of proposals for technological change will be referred to the EEO Committee on the recommendation of the Staff Association(s).

6.6 Automated monitoring of the work output of individual workers shall not be proposed unless individual work output statistics are made available to individuals concerned with his/her agreement and the agreement of the Staff Association concerned.

6.7 New technology shall not invade the privacy of staff and of clients.

6.8 Nothing in these principles will over-ride the provisions of prevailing occupational health and safety legislation and associated regulations, or any Government policy or code or practice, or the terms of the Department's occupational health and safety agreement.

6.9 The objectives of the Department in the introduction of technological change shall be that it not result in retrenchment of staff and the Department notes the Staff Associations' intention to negotiate over off-setting job creation.

6.10 The objective of the Department in the introduction of new technology is to compliment and improve rather than replace the provision of high quality personal services to the clients of the Department.

7. PRINCIPLES OF INFORMATION SHARING

7.1 The parties agree that the general principles regarding information sharing will be:-

7.2 The terms of reference and criteria for any study or trial or tender documentation concerning technological change as previously defined will be subject to consultation.

7 Technical information shall be presented to Staff Associations simultaneously with non-technical descriptions of the subject matter of proposals for change.

7.4 ADP Strategic Plans are recognised as significant documents in relation to the technological change process. Consultation on the content of ADP Strategic Plans will be consistent with the principles in this Memorandum and will occur in sufficient time to allow an orderly consultative process prior to approval by management. Apart from consultation on the Plan itself separate notification and consultation shall occur on projects contained within the Plan.

8. SCOPE OF RESPONSIBILITIES

8.1 Within the Department, the process of consultation over technological change will involve three parties: the project sponsor, Association representatives, and the Assistant Secretary, Employee Relations and Conditions Branch (AS(ER&C)) in Central Office or Industrial Relations Officers in Branch Offices. These parties are defined as follows:

'The Project Sponsor' An officer or body authorised by the Secretary or his delegate to manage or direct projects, including studies and reviews, which may result in the introduction of technological change within the Department.

'Staff Association Representatives' Representatives of a legally constituted Association or Union whose members are employed within the Department and who may be materially affected by the technological changes under consideration.

'Assistant Secretary, Employee Relations and Conditions Branch (AS(ER&C))' An officer responsible for the Industrial Relations function of the Department. This officer is responsible for consultative arrangements for technological change which is the responsibility of Central Office (see Section 9.1). Industrial Relations Officers are responsible for consultative arrangements for technological change within a Branch Office (see Section 9.4).

It is the responsibility of all parties to enhance the process of consultation by:

- the passage of frank, open and timely communications; and
- conforming to reasonable requests for action completion or response dates.

The Project Sponsor will be responsible for:

- providing advice to the AS(ER&C) in writing of any authorized proposal involving the introduction of technological change;

- responding in a timely and complete fashion to any requests for information received from the AS(ER&C);
- the creation of a project environment which is conducive to effective consultation; and
- maintaining satisfactory representation at all meetings, conferences and the like which are integral to the consultative process.

The AS(ER&C) will be responsible for:

- distributing the information to relevant Association representatives;
- communicating Association Representatives responses back to the appropriate section;
- organising consultation between the parties as required; and
- acknowledging receipt in writing of information and correspondence concerning technological change which is received from Staff Associations.

The Staff Associations will be responsible for:

- representing the interests of their members and in particular those likely to be directly affected by the proposed technological change;
- providing satisfactory representation at all meetings, conferences and the like which are integral to the consultative process and have been agreed between the parties; and
- providing the Department with written communication within a reasonable time frame of concerns regarding particular proposals for technological change.

9. LEVEL OF CONSULTATION -

Central Office

9.1 Central Office will consult with Federal Offices of Staff Associations in the following instances:

- Technological change proposed to be introduced into Central Office and/or into more than one Branch Office or Institution;
- Technological change proposed to be introduced into one Branch Office where Staff Associations or the Department regard it as having Departmental-wide implications;
- The Department's overall strategy in particular areas e.g. the ADP Strategic Plan; and

- When a pilot scheme is established, either in Central Office or in a branch, to test a system or equipment with a view to introducing it throughout the Department.

9.2 The AS(ER&C) in Central Office will assist in monitoring the project and will arrange for the area concerned to liaise with the Federal Offices of Staff Associations. In some cases it may be necessary to consult with the Federal Office and State Branch of relevant Staff Associations at the same time.

Branch Offices

9.3 Branches are responsible for consultation at State Branch or Institution level on technological change not included in the above list, and for providing information to relevant State Branches of Staff Associations as set out in this Memorandum.

9.4 Branches should also keep the Central Office informed of the consultation process with State Branches and copies of any documentation given to Staff Associations should be forwarded to Central Office for information and to ensure that Federal Offices of relevant Staff Associations are advised.

9.5 When a Branch is considering the adoption of technological change already adopted in another Branch full details of previous consultation with Staff Associations should be obtained from the originating Branch so that the relevant Branches of Staff Associations can be consulted.

10. TECHNOLOGY DEVELOPMENT PROCESSES AND RELATED CONSULTATIVE PARAMETERS

10.1 Within the Department there are six steps in the development of major technological change and a some what lesser number of formal steps in minor developments. The process of managing change and therefore the consultative process differs little between major and minor developments: the point at which consultation commences is identical and the management of undertakings differ only in the complexity and level of the co-ordinating body. The stages in development of Technology within the Department are:

- Proposal
- Feasibility stage including project approval and funding
- Design Study and preparation of formal proposal
- Development of the System
- Implementation of the system
- Post-Implementation Review.

10.2 The first formally authorised phase is the second, i.e. the feasibility stage, and it is at this time that the formal development process is set in train. Decisions are taken to accept the proposal, to register it on the

Department's National Project Register, to determine the developmental strategy to be applied, i.e. whether it is to be a major or minor development and to establish the management and consultative structure appropriate to the scope and parameters of the development.

10.3 The consultative processes that apply to the stages in the development process are outlined below.

Feasibility Stage

10.4 This is the second formal step in the developmental process which is signified from a management viewpoint by the acceptance of a proposal and its entry in the National Projects Register. The feasibility study should cover the positive and adverse implications of the proposed technological change in accordance with the principles of this Memorandum. At this point the following steps are to be initiated in the consultative process.

- .1) Step 1. Staff Associations at both Federal and State levels are to be advised in writing of the pending Feasibility Stage, the management structure to be adopted to monitor the development and the consultative structure proposed by the Department for the project. The emphasis at this stage will be on the earliest possible notice of likely change, rather than provision of detailed information.
- .2) Step 2 Management and Staff Associations at federal level will consult on the terms of reference of the feasibility study.
- .3) Step 3 Subject to normal requirements regarding confidentiality of certain information, the following information is to be provided to Staff Associations in writing as it becomes available:
 - (i) a full description of how the relevant work is presently being done, including technical description of any technology used.
 - (ii) A technical explanation of the nature and scope of the technological change being considered, reasons for the proposed change, any information about the effects of its use elsewhere and the possible penalties for not introducing the change
 - (iii) The possible ways in which the equipment or system may be operated. The location and description of the equipment proposed (if known).
 - (iv) Impact on clients of DVA.
 - (v) Advice on expected benefits of introducing the technological change and the means by which the benefits expected to clients and staff will be distributed.

- (vi) The numbers, classifications and locations of staff who may be affected by the technological change proposed to be introduced and likely interfaces with other functional areas in the Department. This information should identify implications for the Department's EEO policy.
- (vii) Skill levels required for the introduction of the technology and the training of staff, including re-training of existing staff, which might be necessary.
- (viii) Possible changes to staffing structures in operational areas.
- (ix) Advice of proposals in respect of any possible redeployment or transfer situations.
- (x) Implications, if any, of the technological change for the occupational health and physical work environment of staff employed in its use, and for any other aspects of quality of working life.
- (xi) Privacy and security provisions relating to the interests of staff and clients.
- (xii) The proposed rate and time frame for the exercise, recognising that, in the interests of early advice and consultation, initial advice may not be able to cover all of the above points in detail, and that in practice in many cases the information may need to be made available on a progressive basis or in comparatively general terms.

10.5 On receiving initial advice, or at any stage in the course of receiving progressive advice on the details, any Staff Association with direct interest may raise aspects of concern to it, preferably by writing to the Assistant Secretary, Employee Relations and Conditions Branch or raising the matter at the Department's regular or special consultation meetings on technological change.

10.6 It is an objective of the consultative process that the early advice of concerns will, in general, enable the consideration of alternative approaches to such issues without disruption to the progress of agreed projects.

10.7 Documentation provided to Staff Associations will include a staff impact statement based on the format set out at Attachment A as the information becomes available.

Remaining Stages

10.8 Subsequent stages in the system development cycle include:

- preparation of design studies
- formal proposals
- system development and implementation.

It is important to note that during the system development and implementation stages clarification of requirements may need some system redesign or modifications. During these stages more detailed and more accurate staffing information will become progressively available and the staff impact document provided under 10.7 will be progressively updated to incorporate that information.

10.9 The consultative structure and information sharing process established during the Feasibility stage may be subject to minor changes but the principles established will pertain to the total development process. Staff Associations will be provided access to information collected and proposals generated by Project Teams and will, apart from consultation at that level to ensure maximum agreement, be able to make further representation on unresolved matters of concern to Project Steering Committees or Senior Departmental management. This will ensure the fullest consideration of any alternative arrangements which they wish to propose. All matters raised by the Staff Associations will be responded to by the Department, with reasons, as soon as possible.

10.11 Where agreement cannot be reached it is open to either party to invoke established procedures for the resolution of disputes.

11. TRIALS OR PILOT STUDIES

11.1 On some occasions when new technology is being considered, a trial period (or pilot study) of the new equipment may be helpful to, and could be agreed as part of, the consultative process. It would enable identification of problems, disadvantages and advantages and provide a fuller understanding of what is involved. Should the Department wish to undertake a trial of new technology, or where a trial or pilot is agreed between the Department and relevant Staff Associations, the Department will consult on the detailed specification proposals and arrangements for the trial and will provide:

- the number, location and classification of staff who would be affected by the trial;
- the proposed applications of the new equipment; and
- the opportunity for Staff Association representatives to arrange discussions during working hours with member affected by the trial; and
- timeframe for proposed trial/s.

Where it is agreed that a trial should be conducted the trial will be jointly evaluated.

ON-SITE INSPECTIONS

12.1 Inspection of new equipment located in the work place is a legitimate requirement. In the case of inspections by the joint consultative body, notifications of pending inspections should be passed through normal management channels. In the case where Staff Associations wish to carry out on-site inspections, reasonable notice of the requirement should be passed to the Assistant Secretary, Employee Relations and Conditions Branch where consultation is occurring at federal level, or the Deputy Commissioner where consultation is occurring at State level.

WORK ENVIRONMENT AND OCCUPATIONAL HEALTH

The Department and Staff Associations agree to negotiate codes of practice and guidelines for general application to specific technological change initiatives.

14. TRAINING

14.1 The Department will provide training and encourage staff to become conversant with new technology, and consult with Staff Associations on training needs. Training needs are to be jointly reviewed on a regular basis.

15. TECHNOLOGICAL CHANGE INVOLVING OTHER DEPARTMENTS

15.1 Where the effects of the technological change encompass a number of departments, the Public Service Board may co-ordinate consultation with the Staff Associations.

16. REVIEW

This memorandum of understanding will be subject to joint review 12 months after coming into operation.

ATTACHMENT A

STAFF IMPACT DOCUMENT

CONTENTS

1. EXISTING WORKING ARRANGEMENTS/SYSTEM

- brief description
- staff involved (establishment and actual) by:
 - . designation/grade
 - . number
 - . location
 - . employment status (e.g. full time, part time, temporary, permanent)
- description of duties
- duty statements
- staffing organisation
- organisation charts
- management information systems (e.g. work monitoring)

2. PROPOSED WORKING ARRANGEMENTS/SYSTEM

- comparative cost
- technical explanation of the nature and scope of the proposed technological change
- description of the way in which the technological change may be operated (including options)
- staff who would be involved by:
 - . designation/grade
 - . number
 - . location
 - . employment status
- description of proposed duties
- proposed duty statements
- reclassification proposals
- proposed staffing organisation
- proposed organisation charts
- description of new/different skills required
- description of changes in work practices
- description of ongoing training requirements and arrangements
- description of changes to working environment
- description of occupational health and safety implications
- description of new/different management information systems
- description of new/different conditions of employment
- description of new/different hours of duty
- implications for equal employment opportunity
- implications for industrial democracy

RELATIONSHIP WITH OTHER SYSTEMS

- What will be the likely interfaces with other systems and other functional areas?

4. EFFECT ON OTHER STAFF

- What will be the effect on staff in areas indirectly affected by the proposed technological change? Particular attention should be paid to staff from areas which supply input to or use output from the proposed technological change

5. REDEPLOYMENT/RELOCATION

- Is redeployment or relocation involved?
- If so what will be involved in terms of:
 - . designations?
 - . numbers?
 - . locations?
 - . physical transfers?
 - . salary maintenance?
 - . retraining?
 - . career opportunities?
 - . financial support?

6. SYSTEM DEVELOPMENT PHASE (To be provided on request by Staff Associations)

- What staff are involved in system development in terms of:
 - . designations?
 - . numbers?
 - . locations?
- Will they be full time or part time on system development?
- For what period will they be required?

7. INSTALLATION/OPERATIONAL STAGE

- What staff (locations, numbers, designations) will be required for installation and to operate and maintain both the old and new systems during this stage?
- What arrangements will be necessary for release and relief of staff to receive training on the new system?
- What final relief ratios are proposed?
- What training will be provided?
- What staff are needed for the conversion of records?

- What arrangements are to be made for recruitment of installation teams and what happens to them after the installation?
- Are there any occupational safety and health issues involved during the installation/operations stage?

APPENDIX 2

Letter from Public Accounts Committee
of 12 February 1986
to Department of Veterans' Affairs
requesting further information



COMMONWEALTH OF AUSTRALIA
JOINT PARLIAMENTARY COMMITTEE OF PUBLIC ACCOUNTS

PARLIAMENT HOUSE
CANBERRA, A.C.T.
TEL. 727455
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Mr S J Wooley
Assistant Secretary
Systems Division
Department of Veterans' Affairs
MLC Tower
PHILLIP ACT

SUBMISSION ON ADP ACQUISITION PROPOSAL
FOR REPATRIATION HOSPITALS

Further to your discussion with Mr Erbacher and Dr Capp on Friday 7 February I am writing to request further information in support of your Department's ADP acquisition proposal for the Repatriation Hospitals. This information falls into two categories.

i) Further information which we suggest be included in a revised and necessarily expanded submission to the Committee. This submission would remain the principal document tendered as evidence in support of your proposal. Our ADP advisers' comments on each section of the submission are at Attachment A.

ii) More detailed information which will assist the Committee's ADP advisers in evaluating the proposal and briefing the Committee. A list of questions seeking this information is at Attachment B.

There is a good deal of common information requested at Attachments A and B. I suggest that where the answers to the questions asked in Attachment B are included in your revised submission, you simply provide a cross reference.

Our principal impression of your submission and its supporting documents is one of inadequate explanation and justification of a proposal that should be relatively easy to justify. The submission itself does not provide a sufficiently clear and comprehensive description of the total integrated hospital information system which is proposed, of the project planning and management which will support its implementation and of its justification.

Some of this information may be contained in the supporting documentation and in particular the DISC and Ferris Norton reports, but it is not clearly identified in the relevant sections of the proposal overview document. Additionally there are inconsistencies between information contained in these reports and the submission which are not explained.

The executive summary and proposal overview should, without reference to supporting documentation, mount the case for the proposal. Its relative brevity should not preclude the inclusion of hard facts and figures on the proposed configuration, applications and their costs and benefits. Where further information is provided in supporting documents it should be clearly referenced in the relevant sections of the submission. Any changes which have occurred since the preparation of supporting documents (for example, on the costing of the proposal) should be highlighted and explained.

Where information requested in the guidelines is not available (for example, the results of a job impact study requested under item xii) we recommend this be stated directly and reasons given. We note that no information has been provided under items vi, ix) and xiv) listed in the Committee's guidelines.

In the light of our discussions last Friday we would like to give you some forewarning of some of the concerns we expect the Committee will have about the proposal.

It would appear that the proposal in its present form focusses on only the 'core' hardware acquisition and system, with additional equipment purchases and applications being implemented over a period of 5 years or more. Such an incremental approach would seem quite reasonable provided that initial decisions on equipment acquisition and application development anticipate future requirements and there is a clear development path set out for the total system.

Hence, in considering your Department's proposal, the Committee would be seeking evidence that the 'core' system proposed for RGH's is part of an integrated strategy for the development of information technology systems in the hospitals. The Department's draft Strategic Plan provides some evidence of the Department's aspirations in this area but little information about its precise priorities and the manner and sequence in which applications are to be developed and implemented.

If it is not proposed to include this level of detailed information in the Department's Strategic Plan, it is certainly necessary that it be presented in the submission supporting this acquisition proposal. If as section 3.4.4.1 of the draft Strategic Plan implies, these priorities and implementation schedule have not been fully

determined, the Committee will undoubtedly wish to know when and how they will be. It will also be pleased to receive a final version of the Department's Strategic Plan as soon as possible and certainly before hearings are held on this proposal.

We would of course appreciate receiving a response on these matters as soon as possible so that we may identify and resolve any outstanding issues well in advance of hearings. These have been tentatively scheduled for Thursday 20 March. However receipt of your revised submission is requested by close of business Friday 28 February, to ensure that the Committee has an opportunity to review the submission at a private meeting prior to the proposed hearings.

Should you require further clarification of this request please contact myself or Dr Capp in the Secretariat.

M J Talberg
M J TALBERG
Secretary

12 February 1986

This section looks at each guideline in turn and comments on the adequacy or otherwise of the submitted document(s).

1. Executive Summary

A summary is provided but there is no reference to where supporting detail of configurations and pricing exist. The funds requested do not seem to match up with any given in the Strategic Plan or consultants' reports.

Likewise, most other aspects of the summary do not indicate where the detail is to be found and support provided for the case presented.

2. Proposal Overview

2.1 Nature and Justification

There is no indication of the actual "New Policy Proposal" as approved by the Cabinet. Further the "New Policy Proposal Estimates" do not match up with the amount mentioned in this part of the DVA submission, or implied in the action plan when coupled with the Ferris Norton costing of suitable equipment.

DVA should be asked for supporting detail of the configurations and prices, matched with the action plan, to verify the \$10 Million overall and \$2.4 Million in 1985/86.

The outline of what is intended in terms of applications presents a sound case except for the problem that no-one seems to know how PCS was selected. DVA should reference what earlier approval was obtained and commit to providing its survey and analysis to the Hospitals.

The justification is an overview. The cost benefit provided by the DISC report and the Ferris Norton report should be included in summary to provide a visible justification. These figures broken up by Hospital would also provide the justification of choice of Concord as the starting point.

2.2 ADP Objectives

This section is deficient in not stating what are the ADP objectives of this proposal and relating them to approved objectives and programmes. However, much of this is implicit in other areas where approval for PCS and the Strategic Plan are indicated.

The submission lacks specific objectives, which would seem to be to provide a core Patient Master Index in an architected Health Care System allowing for addition of functions later; and to provide a limited set of immediate functions for ADT, Order Entry etc.

A simple question to DVA on what they hope to achieve in Hospitals by this request should suffice to bring out the necessary statement.

2.3 Corporate Plan

The best that could be said is that a set of objectives have been provided. Reference to the ADP Strategic Plan is not a substitute for a Corporate Business Plan.

Ferris Norton pointed to the lack of a Corporate Plan and DVA should be urged to proceed to do so. However, in the absence of anything more than objectives, the Ferris Norton recommendations form an adequate basis for a computing infrastructure.

Some statement should be provided on how the proposal furthers the objectives. This is suggested not because the proposal is unreasonable, but so that some yardstick is specified for future reviews.

2.4 ADP Strategic Plan

While the strategic plan itself warrants comments in a number of areas, the proposals here do appear to be a subset of the plan. In the absence of configurations proposed it is difficult to match up the submission with the Strategic Plan.

As regards the plan and the Ferris Norton study, and as acknowledged in the latter, there is inadequate treatment of Network requirements and the need for integration. DVA should be queried on what Network needs have been determined and how. Are there any real needs for Hospital to Hospital communication? What data need transmission between Hospitals and B.O. or C.O.? How does DVA justify specific Network costs in the absence of a study of needs?

The plan is also sketchy on the staffing side. There is no detail on what ADP people are required where, when they are needed, or what skill levels are required.

The Ferris Norton recommendations as included in the Strategic Plan envisage equivalent equipment used for office automation, thereby providing the on-site back up capability needed for 24 hour operation. This submission clearly does not include such equipment and hence considerations of contingency planning are non-existent. What does DVA envisage it will do to keep hospitals up and running?

The plan does not include Risk Analysis but refers to the detailed one in the Ferris Norton report, which seems adequate for the NCC. Contingency planning is only alluded to by assuming the network will enable backup - a possibility which needs considerable study and extra cost on lines and equipment. Internal audit participation is not addressed.

2.5 Post Implementation Review

As much of the proposed initial functions replace earlier facilities, DVA should be able to provide an assessment of the benefits achieved. Certainly something has contributed to halving the length of stay over the past 10 years. How much of this is a contribution from the present system?

The submission discusses the shortcomings of the present systems, but there is no indication of a specific review having been performed. Details of staff involved in Hospital systems, their grades and length of involvement in ADT systems or PCS are not mentioned. Nor is there any discussion of staff turnover rates including promotions and interproject transfers. These all have a bearing on the ability to implement the new systems successfully. Performance of current systems can be found in the Ferris Norton report but are not referenced in the submission.

It is not clear whether the new systems are expected to include stores inventory and accounting, but deferral of extending the PRIME based systems suggests there has been some thought of this. What is the intent? What has been the benefit of the installed systems?

Lack of data flow information is mentioned in the submission and the various consultant reports. To some extent proceeding with the current submission in the absence of "a clear understanding of RGH hospital information flows, system requirements and priorities" is putting the cart before the horse.

2.6 System Proposals

This section is not included. Presumably the plan is to install PCS as defined in the DISC report. Relation to existing systems is not described.

2.7 Other Options

Choice of PCS pre-empts a number of options that might be considered (e.g. McAuto bureau approach). DVA should be asked to provide a summary of the arguments leading to approval of this choice, to meet the requirements of this guideline.

2.8 Cost Effectiveness

Costing of options is not provided. The reference to the DISC report is adequate for the costing of the selected option although there are two problems.

- a. The costs in the DISC report are not consistent with the Ferris Norton report. Minor changes due to configuration can be expected, but DISC does not include the backup considerations. Neither address communications costs adequately - there is no specification of number, type and speed of lines. Manpower needs look understated.

- b. Costs of other approaches, including time and money for conversion to some other mainframe architecture is not mentioned in any of the provided materials. Costs can be expected to be quite high and easily justify remaining with the current architecture, but some mention of them would be worthwhile in the interests of public accountability.

2.9 Technical Considerations

The Ferris Norton approach constitutes a technical framework. Since this has been accepted via the report and subsequent ADP strategic plans, it constitutes technical limitations of

- . IBM compatibility
- . SNA network
- . 370/XA hardware architecture
- . DCA, DIA standards.

The Department should provide comment on technical considerations, even by reference to the Ferris Norton report, for the selected option and any other options.

2.10 Policy Constraints

The DVA has indicated no constraints. But what about staffing level constraints? Surely these will have an effect on the achievability of the objectives of the proposed systems?

2.11 Action Plan

The action plan in the submission is roughly consistent with that in the two year strategic plan and theoretically follows the Ferris Norton approach of prototype, pilot and propagate. There are, however, some variations which warrant further study or comment.

- a. Requiring a short delivery on a computer at Concord probably constrains who could respond even to a limited tender. Has the Department discussed with potential suppliers the delivery times of equipment (processor and peripherals and terminals) based on a March approval? If so, the schedule should be reviewed to ensure that it enables a response from a reasonable selection of suppliers.
- b. If speed is essential, has consideration been given to the purchase or lease of second hand equipment? Has the Department explored the availability of suitable MVS/XA supporting equipment to be released from other Departments?
- c. The action plan calls for pilot implementation in January to March on D.H.&C. equipment, followed by transfer to Concord system in May.

- d. The strategic plan refers to Greenslopes use of Concord and Hollywood and Daw Park use of Heidelberg. The action plan in the submission does not refer to this. What are the Department's intentions now? If still planning remote access, the submission action plan needs expansion to cater for telecommunications and a further pilot phase on remote operation.

Page 21 of the submission seems to suggest only remote access (without pilot) for SA and WA. What is the Department considering in regard to network requirements? There is no volume data in the Ferris Norton report which would allow design of the Network to achieve appropriate response times and reliability and security. There is reference in the Risk Analysis to the need to achieve two second responses compared with 4-5 seconds now.

- e. As a general rule pilot operation needs to be long enough for users to become comfortable in use of the system to the extent where changes in work habits are apparent and users adapt to using the system the way they want rather than the way the designers thought. Three months pilot must surely be questioned as to its adequacy, but it could be sufficient if the first phase is only a replacement of current ADT systems already familiar to Concord staff.

- f. Achievability of the plan depends on staff availability. There is no indication in the submission of number and grades of staff or contractors to be assigned.

- g. There is no reflection in the plan of participation by Hospital staff and identification of additional requirements or modifications. Nor is there any reference to reviews of progress and performance.

2.12 Industrial Issues

Has a job impact study been undertaken? What Staff Associations were involved? Have medical, para-medical, and nursing staff associations been involved?

What arrangements are being made for training of all hospital staff in awareness of the new systems, what they can or cannot do, and what the implications are for the role each staff group would need to play? What arrangements for training are being made for staff who are expected to use the systems?

2.13 Industry Participation

Is it possible to gain some indication of both IBM and other Hospital systems investment in development?

2.14 Method of Acquisition

There seems to be an automatic assumption of outright new purchase. The submission has no discussion of any other possibilities.

Lease of the Concord IBM system might be a reasonable way to proceed. It would meet the need for an IBM system to gain support and encourage IBM to ensure success to keep the system installed or have an opportunity for further sales.

The submission does not request any specific acquisition approach. In terms of arguments in earlier sections and the time scale required, it does seem to be asking for full Certificate of Exemption for approval to buy IBM for Concord's first machine, and to tender for IBM-compatibles for the rest.

DVA should state its request explicitly so that the arguments can be assembled in one place and provide an obvious reason for approval. Further, the staffing aspects would seem to be more significant than minor variations possible in hardware costs.

2.15 Consultation

The topic is mentioned, but no summary or copy of Public Service comments is provided other than an extract from the reply from the Minister of Finance. Other comments should be provided. The DISC report provides a detailed analysis by an external consultant and is supportive of the proposed action. There are differences between the actions recommended by DISC and those proposed in this submission, as evidenced by different funding figures.

2.16 Consequence of Not Proceeding

No financial on-going loss is identified. There is no discussion on the effect on staff in the Systems area or the Hospitals, which could be considerable. The benefits identified in the DISC report give a measure of the opportunity cost as a consequence of not proceeding.

3. Supporting Documentation

3.1 Corporate Plan is not available.

3.2. Job Impact Study Report

No such report is provided. A document attached to the Staff Association consultation agreement gives the topics to be addressed in such a study.

Where are the results for PCS? Surely if PCS at first replaces current ADT with some extra facilities the impact should be easy to determine.

3.3 Consultants' Reports

Consultants' reports are provided from Ferris Norton and from DISC International.

The qualifications of those involved in these studies is not clear. Given the likely staffing, DVA should be queried as to the extent that experience with Hospital Systems was available from the consultants or by working participation of hospital staff.

DVA should also be queried on Risk Analysis in the Hospitals as the information in the Ferris Norton report seems to relate only to the NCC functions. This, of course, does include current equivalents to parts of PCS.

A copy of the Brand report was submitted, together with a document purporting to be an analysis of the relevant Brand recommendations. DVA should indicate the source and standing of the comments submitted.

In addition, the following aspects seem to need comment.

- a. Brand Report (4.17) relates to RGH inability to provide bed-needs. Reduction in LOS should improve ability to provide beds for more patients.
- With so much outside service usage, has DVA considered how details of such patient data gets into PCS to give a full picture? What resources would be needed to collect and enter such data into PMI and clinical files?
- b. Brand Report (Chapter 12) talks of increasing clerical load which should be addressed by an integrated PCS. What are the Department's comments on these findings as related to PCS?
- c. Right of Private Practice imposes possible interfaces into PCS-AIMS and provision of billing systems. When and how does DVA envisage providing these components?
- d. Responses on Chapter 15 don't seem to indicate an awareness of the need to get the Medical Records Consultant, if not people from Hospitals, involved in defining needs for (additional) PCS modules.

- e. The Personnel Services section is responded to with a note to include a payroll system. No reference is made to the problems of leave and training recording and other aspects impacting the ability to schedule nursing staff, out-patients, etc.
- f. Chapter 28 responses do not indicate an awareness of the need to communicate to the hospitals as well as gain input. This applies to PCS in particular but also on a broader level of what DP can do for the hospital and its staff.

ATTACHMENT B

Proposal Content

1. What is the boundary of this submission to the JPCA? In other words what is the relationship between this proposal and the long term computing requirements of RGH's? Can DVA supply a configuration chart of the proposed equipment and its linkages to the NCC and to other proposed RGH sites?
2. What OA functions are planned for in this submission? What OA functions and equipment will be subsequently added?
3. Should not WP and electronic mail be associated closely with PCS? Are their acquisition part of this proposal?
4. What is involved in the software environment of the submission outside the operating system, utilities and PCS?

Overall Strategy

1. What analysis of the overall data holdings and information flows of an RGH exist? What is the major overall direction RGH computer applications are leading in and has this strategy been considered at the executive level?
2. What plans exist for subsequent implementation of systems in RGH's? How firm are subsequent plans? What flexibility exists in plans to cope with initial experiences and RGH differences? What are the priorities for subsequent implementations?
3. Brand calls for a review of all computer needs at RGH. To what extent has this been carried out?
4. What resources are to be made available for the above review and for explaining the proposal to RGH staff? What resources are to be supplied by RGH's? What costs are involved?

Costs

1. What degree of education of the respondents in the PCS survey was undertaken prior to conducting the survey? How reliable are the results? How reliable are the somewhat uncorrelated benefits claimed in the survey for hospitals vis-a-vis their size? Note Concord's savings are large compared with Heidelberg.
2. Where are the costs of entering patient data for the pilots recorded?
3. Has consideration been given to the purchase or lease of second hand equipment? Has DVA explored the availability of suitable MVS/XA supporting equipment to be released from other departments?
4. What is the cost/benefit justification for a distributed system over a central site expanded NCC?
5. Can the costs and benefits of the various options outlined above be brought together for ease of presentation to the Committee? These appear to be differences in costings between the various documents supplied and the submission. Why have these changed over time? Can they be reconciled?
6. What is IBM's statement on Systems Engineering Service on a stand alone basis?
7. What are the costs of using a system other than IBM? (NSW use VAX). What are the delays in doing so?
8. What benefits were achieved with the current systems? What factors have contributed to halving the length of patient stay over the past 10 years in RGH? Have the current systems had an influence?

Planning, Management

1. No Job Impact Study report is provided. What are the results of any such study for PCS?

2. What plans exist for conversion of systems or equipment already in existence in RGH's? What existing equipment will be connected to the proposed equipment?
3. Has the prototype phase been completed? What are the results of the prototype phase? Is further prototype work to be carried out?
4. What monitoring will take place of the pilot? Will it be a truly representative user test? Will it have all Concord patients on the PMS database or only a selection? Is one or two months sufficient time to review the operations of the pilot and assimilate its lessons by way of program and procedure changes? Is the Heidelberg system scheduled too soon after Concord? How is it proposed that the timetable be completed?
5. The Ferris/Norton Risk Analysis is referred to and seems adequate to the NCC. Contingency planning is alluded to by assuming the Network will enable backup. How will backup be affected by variations in client numbers? What are costs of lines and equipment?
6. Has DVA obtained copies of strategic plans prepared for WA Health Computing Services, SAHC, Qld Department of Health and NZ Department of Health? Do these plans include relevant information for the DVA proposal?
7. What are the ADP objectives of the proposal?
8. What does DVA expect to achieve in hospitals by this request?
9. Has DVA developed a corporate plan? How does this proposal further the objectives of the Department?
10. What parts of the Strategic Plan are covered by the proposal?
11. Why is more reliable operations on a 24 hour basis achieved if organised locally?

12. Will IBM be happy with one machine? What will happen if the rest are plug compatible machines? How does the development timetable for PCS and particularly IBM's involvement relate to the tendering/acquisition timetable?
13. Has the department discussed with IBM and other suppliers whether the delivery times as suggested by the action plan are achievable?

PCS

1. What is the architecture of the PCS system? What systems will be implemented in PCS? What systems will be implemented by other means? What data analysis has been done on the total data holdings of an RGH?
2. Who is or plans to be a user of PCS in Australia? What communications have taken place between them and DVA?
3. What are the relationships between IBM, DVA, Royal Adelaide, each to each? What arrangements exist for design, implementation and support of PCS?
4. Will the PCS team drop off over 5 years? What development is involved in the PCS team's work program? What responsibilities does the PCS team have besides PCS development?
5. Has IBM kept appropriate skills available and involved? How will PCS and DVA's generated system be supported after implementation? How will it be decided who is responsible to rectify faults in DVA's generated system?
6. Why have the difficulties with IBM's support of PCS perceived in the past, improved of late?
7. What progress has been made in PCS modification to date? What is further proposed? What progress has been made in DVA's generated system to date?
8. "DVA decision to adopt PCS is consistent with that planning in several states". What is implied by this statement? How has the trend to applications software manifested itself in Australian hospitals?

9. What knowledge and experience in the existing systems and their flows exists within the PCS team?

10. What will be the cost to DVA of their involvement in PCS's development? What would the cost have been to produce a DVA system from scratch?

11. What proportion of PCS users in Australia or overseas have IBM plug compatible machine?

12. Were alterations to PCS considered? Why were they rejected? Examples include:

Aust. Hospital	CDSA (Aust) P/L	Integrated System
NSW Health Comm.	DEC VAX 11	
Royal Melbourne	MCAuto P/L	
Infohealth	Himas	

What are the costs associated with conversion? Can a study of these reduce the time to carry out the review of total hospital requirements?

13. With so much outside service usage, has DVA considered how details of such patient data gets into PCS to give a full picture? What resources would be needed to collect and enter such data into PMI and clinical files?

14. Brand Report (Chapter 12) talks of increasing clerical load which should be addressed by an integrated PCS. What are the Department's comments on these finding as related to PCS?

15. Right of Private Practice imposes possible interfaces into PCS-AIMS and provision of billing systems. When and how does DVA envisage providing these components?

Communications

1. The submission does not discuss communications in any detail. Are there any communications acquisitions seen as part of this proposal? What type, numbers, and speeds of lines are required to effect the necessary communications links?

2. To what extent is the proposed network integrated with and part of the existing network?
3. What backup is there to support 24 hour operation? What are the contingency plans? What does DVA envisage it will do to keep hospitals up and running?
4. Will it always be possible to backup to another site? What are the steps involved in achieving Concord hospital running off the Heidelberg hospital system after a Concord system outage?
5. How does DVA justify specific network costs in the absence of a study of needs? What network needs have been determined and how? Are there any real needs for hospital to hospital communication? What data need transmission between hospitals and BO and CO?
6. Page 11 states "Integration of data, text, facsimile, copies and digitised images dictate that the major computing facilities in the network must be IBM compatible". Why is this statement made? Why is it so?
7. How can improved levels of backup be achieved by decentralisation? Is a network required to support this backup? What sort of network?

8. The selection on Advanced Technology Considerations indicates that advanced technological features are involved. Is not the networking arrangement, office automation etc sufficiently advanced vis-a-vis current arrangements?
9. What plans exist to connect other DVA facilities (e.g. Turramurra Rehabilitation Centre) to RGH's? What equipment, lines etc are involved?

Staffing

12432

1. What is the role of technical staff at each RGH and how many and at what classification are the staff required? How many are available and what are their classifications? What role do these staff fulfil when outages occur in the RGH system? What involvement do these staff have in initial and on-going training? What involvement do these staff have in user-liaison prior to production of specifications for new system functions?

2. The attitude of Concord in its responses appears to be more favourable than others. What problems does DVA see in implementing in other sites and how are these to be overcome?
3. Is the DISC recommendations to assign other hospital staff to the pilot project and allow local amendments at each new site to be followed? Who is responsible for local amendments?
4. What steps are being taken to insure end user involvement and union co-operation? What staff associations are potentially involved? What is planned for the future especially as regards medical, para-medical and nursing staff?
5. What opportunities have been taken over the past twelve months to advise affected or involved staff?
6. In relation to PCS development, implementation, on-going support etc, what ADP staff, skills and skill levels are required where and when?
7. What staffing level constraints will affect the achievability of the objectives of the proposed systems?
8. What staff associations are involved? Have medical, para-medical and nursing staff associations been involved?
9. What arrangements are being made for training of all hospital staff in awareness of the new systems, what they can or cannot do, and what the implications are for the role each staff group would need to play? What arrangements for training are being made for staff who are expected to use the systems?

Other

1. Can a chart be prepared showing the increase in use of CPU time as users come on stream and new modules are introduced? What is the basis of the sizing calculations leading to the decision of a 4381 Group 2 processor?

2. Why would the central service close if the RGH's were transferred to the states?
3. Page 6. Is DVA having difficulty in getting support for MVS on AMDAHL? Will this improve if there is a IBM machine in Concord? Will they really help NCC with installation of MVX/XA?
4. What has DVA done to resolve the problems outlined in DISC 3.2.3?
5. What are the source and current standing of the comments submitted in the documentation of analysis of the Brand recommendations? Page 13-14.
6. Machines used by the University of IOWA and Stonybrook both seem to have significantly greater power than is proposed in the submission, yet are not significantly greater in size. Is the 4381 sufficiently powerful? Why? Why do these hospitals require 3080's?

APPENDIX 3

Letter from Department of Veterans' Affairs
of 5 March 1986 to Public Accounts Committee

Supplement to the Reference to the
Joint Parliamentary Committee of Public Accounts
of Repatriation Hospital Computing Facilities



Department of Veterans' Affairs

Office of the Secretary

MLC Tower
Woden ACT
Australia 2606

5 March 1986

I refer to your memorandum of 12 February 1986, addressed to Mr Wookey, FAS(Systems), requesting further information in support of the Department's proposal to acquire computers for installation in five Repatriation General Hospitals.

The attached document addresses the questions and issues raised in Attachments A and B to your memorandum. It has been prepared as a supplement to the Department's reference to the Committee, dated 29 October 1985.

I understand that a Committee hearing has been scheduled for 9.00 am Thursday, 20 March 1986, to consider this proposal.

(Sgt.) /s/ VOLKER

(D. Volker)
Secretary

Mr M.J. Talberg,
Secretary,
Joint Parliamentary Committee
of Public Accounts,
Parliament House,
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SUPPLEMENT TO THE REFERENCE TO

THE JOINT PARLIAMENTARY COMMITTEE OF PUBLIC ACCOUNTS ON REPATRIATION HOSPITAL COMPUTING FACILITIES

NOTE : This document is a response to the questions and issues raised by the Secretariat to the JPCPA in its Memorandum of 12 February 1986.

For convenience, the questions and issues are referenced in sequence in the following pages by Key Words in CAPITALS, prefixed by Roman Numerals.

March 1986

RESPONSES TO ATTACHMENT A TO JPCPA MEMORANDUM

OF 12 FEBRUARY 1986

1. EXECUTIVE SUMMARY

(i) PROJECT FUNDING

A configuration of equipment proposed for ROH Concord is at Appendix 1.

Project costs and funding requirements variously expressed in the Proposal and supporting documents have been brought together in Appendix 2. In terms of the guidelines for a reference of computing proposals to the JPCPA, the acquisition cost of hardware, operating software and site preparation for the computer installations in the Repatriation General Hospitals, over four years, is \$10m in 1985 terms.

2. PROPOSAL OVERVIEW

2.1 NATURE AND JUSTIFICATION

(i) NEW POLICY PROPOSAL

The Department has not provided a copy of the New Policy Proposal owing to its classification as Cabinet-in-Confidence. The following information is extracted from the NPP.

The NPP objectives were:

"To provide mainland Repatriation General Hospitals (RGHs) with reliable, responsive computing facilities at a program cost of \$9.8m over four years to support:

- the introduction of integrated management and administrative computer systems estimated to reduce hospital operating budgets by 5%;
- management information needs on a seven-day twentyfour hour operations basis;
- local responsibility for systems determination and implementation."

Options considered in the NPP to meet computer processing workloads associated with the Patient Care System under development and other system were stated as including:

- expanded central facilities at the Department's National Computer Centre (NCC);

- a program of computer installations in hospitals.

"The latter approach provides for:

- more reliable operations with less dependence on extended national telecommunications links;
- improved backup to computer operations through decentralised installations; and
- the eventual transfer of each Repatriation Hospital to the State system on otherwise as Government decides in the mid to late 1990s."

"....Overseas experience indicates that a saving of 5% of the total hospital operating budget (\$207.5m in 1983-84) is achievable with full systems implementation."

The first computer installation is planned for ROH Concord for the end of 1986."

The NPP was passed to a number of Departments for Co-ordination. Their comments were as follows:

Supplied " IN-CONFIDENCE " to the Committee.

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Supplied " IN-CONFIDENCE " to the Committee.

A statement outlining the DVA Budget Highlights 1985 advises, at page 19, of the approval of the hospital computing facilities program, with expenditure of \$2.6m in 1985/86.

The various statements of costs from the NPP, strategic plan and supporting documents are compared at Appendix 2.

(ii) CONFIGURATION DETAILS

Configuration details and cost estimates are at Appendices 1 and 2.

(iii) PCS SELECTION

Regular conferences of Medical Superintendents from the late 1970's canvassed the need to expand the Admissions, Discharges and Transfers (ADT) system installed in the early 1970's to meet a wider range of patient care needs:

- the specification of requirements for a new system was developed in consultation with senior hospital staff over several years;

An evaluation of available systems was made and the case presented to several meetings of Medical Superintendents:

- the AS(Systems) went to the US in 1980 to inspect hospital systems;
- he assessed PCS as the only proven system capable of meeting the specified needs, based on the Department's only computing facility at the National Computing Centre (NCC);
- the case was accepted by the Department of Administrative Services and the Department of Finance and funds were provided in 1981/82 for both the PCS package and a new computer to meet both PCS requirements and an expanded NCC user workload;
- DAS subsequently rejected the cost/benefit case for a "turn-key" installation of both PCS.

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application software and computer and insisted on acquisition of the cheapest hardware from Amdahl:

- IBM then would not join in developing a DVA version of the central patient data base using PCS on an Amdahl and the project was shelved.

The project was resurrected at the insistence of Medical Superintendents and when the Systems Division was formed in 1982/83 the FAS requested a review of PCS as the vehicle to develop a set of integrated systems for patient care:

- on the basis of this review it was confirmed that PCS should be used, funds were allocated and the product acquired in 1983/84;

- Medical Superintendents were party to this decision but the extent of consultation within each RGH would not have been great as there were no systems already tailored to unique DVA needs against which users could offer comment.

Background to the selection and suitability to DVA needs of the Patient Care Software is outlined in the document at Appendix 3.

Since a project team was established in late 1984 ADP Steering Committees have been established in each RGH and presentations given by the Project Director to a wide range of RGH staff on the PCS product, the reasons for its selection and the implementation plan, commencing with the Admissions system:

- an officer experienced in the Admissions system was seconded from each hospital to develop the specification for the new system which was approved in May 1985;
- access to a government owned IBM computer was arranged on the premise that IBM would contract to modify its product to our specifications to provide us with an acceptable "turn-key" system.

There have been substantial disruptions to the project because of the earlier DAS opposition to "turn-key" solutions encompassing both an application package and hardware. This attitude has changed and such contracts are now normal, e.g.:

- a Biochemical system from Nicholson on a Webster computer installed in 3 RGHs;

- a Stores Control system from Wards on a Prime computer installed in 3 RGHs;

These DVA applications are typical of many within the Australian Public Service.

DVA now has access to a redesigned ADT system available for test as soon as a machine can be acquired.

(iv) JUSTIFICATION

The Disc International consultant concluded that benefits in dollar terms of \$37.1m are achievable over five years with anticipated costs of \$20.5m. (Section 5 of DISC). These benefits are identified in the DISC Report on an individual RGH basis.

The justification for RGH Concord as the PCS starting point and development centre is based on the facts that:

- Concord is the largest RGH and provides the most testing environment for systems development;
- it is in close proximity to the technical support resident at the NCC in Sydney;
- it is the closest of the hospitals to the DVA systems development resources in Canberra;
- Concord was best able to accommodate the PCS Project staff.

2.2/2.3 ADP OBJECTIVES AND THE CORPORATE PLAN

(i) DEPARTMENTAL PROGRAMS

The Corporate Mission of DVA is addressed within seven programs and all, with the exception of the War Memorial program, are heavily dependent on the central computerised Client Data Base (CDB) containing personal details of our client veterans and their dependants.

ADP systems are installed or being developed to assist in more effective delivery of services under each of these programs using the CDB.

Two major programs require access to medical records which are not included in the CDB:

- the Compensation Program aims to compensate eligible Veterans and other persons for the loss of physical or mental well-being and the effect of that loss on lifestyle (including employment) as a result of disabilities caused by eligible service. It also compensates eligible dependants for the death of a spouse or parent as a result of disabilities accepted as related to service;

- Medical opinions as to entitlement of claimants are obtained from Departmental medical staff, general practitioners and specialists;

The Health Program provides access to a comprehensive range of health and social well-being services that cover diagnosis and treatment of physical and mental disorders:

- these services are provided by general practitioners, specialists and allied health professionals in the community, by staff attached either to a DVA Branch Office or RGH, by institutions such as the Repatriation Artificial Limb Appliance Centre (RALACs) or at the RGHs.

The Compensation Program is administered from Branch Offices and the Health Program from both Branch Offices and DVA institutions (RGHs, RALACs, nursing homes etc.)

There is a constant flow of medical records from hospitals to other sites. This has adverse effects on the hospitals' ability to treat patients.

(ii) ADP OBJECTIVES

The principal ADP objectives of these proposals are:

- to establish computerised records of medical diagnosis, treatment and history of clients which will be accessible to all authorised users of such information;
- to assist hospital staff to process information matching patient needs to the particular service they provide in the most effective, responsive and efficient manner.

(iii) SPECIFIC OBJECTIVES

In pursuit of the ADP Objectives, it is proposed to acquire IBM-compatible mainframe computers for installation in the five mainland RGHs. These computers are intended to operate the IBM PCS/ADS software, allowing the development or acquisition of a range of patient management applications aimed at improving patient care and hospital efficiency.

The primary purpose of the proposed integrated hospital information system is to contribute to the Department's patient care objectives. Timely, accurate and appropriate information will support decision making in the planning, provision and management of patient care.

The first application module to be installed will be the Patient Master Index/Inpatient Management system which is the foundation for other patient-based applications.

The second module of PCS to be installed will address Outpatient Appointment Scheduling.

Future PCS modules, which will build upon the patient data base and be developed or enhanced using the PCS Application Development System, will affect other areas of hospital activity including outpatient departments, wards, laboratories, allied health and pharmacies. Proposals have yet to be formulated for these systems. Priorities for their implementation, which could differ between RGHs, have yet to be considered.

There are potentially more than one-hundred PCS applications within an integrated hospital information system. Progress will be conditioned by the availability of resources to review requirements and to propose and implement solutions. Individual hospitals will set system priorities and determine enhancements/modifications to "packaged" solutions.

No attempt has been made to assess long-term system priorities in an environment of evolving RGH awareness of requirements and of PCS product development and packaged solutions.

Introduction of computing facilities into the RGHs is to be phased over three financial years. The Admissions and Discharges system, currently supported from the DVA National Computer Centre, will need to continue in use until each hospital has access to the replacement PCS inpatient management system on its own computer or on a suitable interim facility. The new computers are to be compatible with the hardware and software facilities at the National Computer Centre. This will ensure:

- continued support and operations assistance by experienced NCC technical staff;
- sharing of access to Veteran data bases between Branch Offices and RGHs for benefits and treatment management purposes;
- progressive assumption of computer management, operations and support responsibilities by the RGHs as resources and skills are acquired.

2.4 ADP STRATEGIC PLAN

(i) NETWORKING REQUIREMENT

The Department's national SNA network links all Branches and RGHs to the National Computer Centre and to each other through the NCC.

Terminal transactions were sampled for B.O. and RGH Concord during September and October 1985. The resulting analyses of ADP systems usage at Appendix 4 highlight the corporate significance of client information.

The Patient Care Project will tend to concentrate patient information at the RGHs through the establishment of the Patient Master Index and result in:

- reduced reliance by B.O.s and RGHs on the central Client Data Base for patient status information;
- communications demands upon the RGH computers with the development of PMI data bases on those machines.

It is expected that no significant upgrading of the existing network will be necessary although a study has been initiated to review the local communications links between Branch Offices and their RGHs with the introduction of the RGH computers.

Hospital to hospital communication is currently available. Interrogation of patient status information of veterans who have relocated interstate will continue to be necessary.

(ii) ADP STAFFING

Refer to response to B.7 (i) following.

Possibly the most computerised hospital in the world (Stony Brook N.Y.) has seven programmer/analyst staff. It is heavily dependent on IBM for technical support and draws on users for systems development, testing and implementation.

The DVA central PCS team includes six systems/ADP staff for PCS application development. That team was originally established in 1984.

The NPP identifies the need for additional ADP staff at the NCC for central operations control and support:

- 2 staff in 1985/86, increasing to 5 staff in 1988/89 with the five computers installed.

Two operations staff will be required at each site ahead of computer installation.

Systems development and implementation staff will be drawn from user areas as necessary. Each RGH must provide PCS co-ordination staff with one officer assigned full-time by mid-1986.

If Software Support and Applications Support are not forthcoming from IBM, six additional systems staff will be required on the central PCS team. Systems engineering services and PCS consultancy would need to be acquired under contract.

Hospital systems staffing requirements, including those for the PCS Project, are set out at Appendix 10.

(iii) CONTINGENCY PLANNING

Refer to responses to B.6 (iii), (iv), (vii) for further information on contingency planning and backup.

There is increasing evidence that a backup processor is not required if:

- the computer is installed at the hospital, thereby reducing dependency on long distance lines;
- equipments installed are as reliable as those supplied by IBM.

A recent study tour by W.A. Health Department officers (report provided herewith as Appendix 5) found five of eight hospitals using single processors and the other three did not configure the second processor in a backup environment. Backup was stated as not necessary with 98%-99% reliability.

DVA will develop manual backup procedures, as at present, for critical processes. Data base backup arrangements will be developed in consultation with IBM and on the basis of overseas PCS experience.

The decentralisation of facilities in the RGHs will provide limited backup against disaster and prolonged outage through DVA network access to comparable PCS-oriented facilities in other RGHs.

The proposed central hospital facility will provide Office Automation support but it is backed up by a strategy of installing micro-computer workstations (PC's) for such stand-alone applications as Word Processing, Electronic Filing etc. These PC's can be networked to common files or communication servers to provide Electronic Mail within the hospital or access to client records and Departmental systems on the DVA network.

The Assistant Secretary (Internal Audit) is a member of the DVA PCS Steering Committee. Internal Audit is represented in the implementation planning for

hardware and applications. Advice will be sought regarding the proposed RGH computing facilities accommodation and PCS access security.

2.5 POST IMPLEMENTATION REVIEW

(i) REVIEW OF EXISTING SYSTEMS

The existing systems were developed with the following objectives:

(Objectives that are considered to have been met are marked with an asterisk *)

Admissions, Discharges and Transfers.

- Create and maintain an accurate record, containing personal, administrative and basic medical data which is readily accessible by authorised hospital staff for all patients.*
- Maintain accurate bed state information (including planned admissions) which is readily available to staff responsible for bed allocation.*
- Print self-adhesive labels containing patient identification details for use by hospital staff in labelling clinical documents.*
- Compile and print statistical listings relating to patients, specialists, length of stay, medical category for use as required by management to optimise hospital resources.*
- Provide a basis by means of the Patient Status File and access to the Client Data Base for implementation of future hospital systems e.g. Food Services, CDB development, Medical Records Abstract.
- Provide an accurate and up-to-date on line patient condition facility for use by staff handling enquiries from relative and friends.*
- Provide for storage of discharged and deceased patient information on a historical file for research and analysis.*
- Provide accurate personal information and/or eligibility information rapidly by access to the Client Data Base.*

Food Services

- Automatically provide details for patient movements to the Food Services area of the hospital.*
- Improve control over the patient menu cards and automatically provide details of change in patient condition to the Food Services area to assist in the preparation of suitable meals for all patients.*
- Provide an accurate and up-to-date record of patients' diet codes to the Food Services area to assist in the preparation of suitable meals for all patients.*

Infection Control

- Record with minimum data input information on surgical procedures for use in surveys of infection occurrences.
- Provide information on gross infection rates in each hospital by producing regular reports on infection trends.
- Assist hospital effectiveness by providing current and cumulative infection rates by ward, surgeon, theatre.

Figures on staff turnover in ADT user areas are not readily available. It is probable that they are as high as in other hospital functions and in other hospitals. Procedures will need to be developed to ensure systems are not unduly impacted by the effects of high staff turnover in the RGHs. Appendix 4 will serve to identify the widespread involvement of hospital staff with the current, basic systems.

The progressive reduction in length of patient stay has undoubtedly been caused by the interaction of numerous factors, including the introduction of computer systems. Nevertheless it is apparent to management that modern data base and communications systems can result in further reductions in length of stay and in the avoidance of substantial costs on the basis of the current nature and level of RGH operations.

There has been no formal review of the current system. However the development of the PCS functional specification during 1984/85/86 has brought about a complete assessment of current system achievement.

(ii) RESOURCE MANAGEMENT SYSTEMS

Resources do not permit the early installation of further PRIME-based stores inventory and accounting systems in the RGHs in South Australia, Western Australia and Tasmania.

Stores inventory and accounting systems are available under PCS/ADS from software vendors. It is expected that the IBM-compatible mainframes will provide the means for implementing Inventory Systems into the smaller States during 1987/88 and will assume the processing of inventory and accounting systems in all States in the long-term.

A DVA personnel management and payroll interfacing system is under development (PAPAS). The system will be installed on the computing facility at the NCC.

(iii) HOSPITAL INFORMATION FLOWS

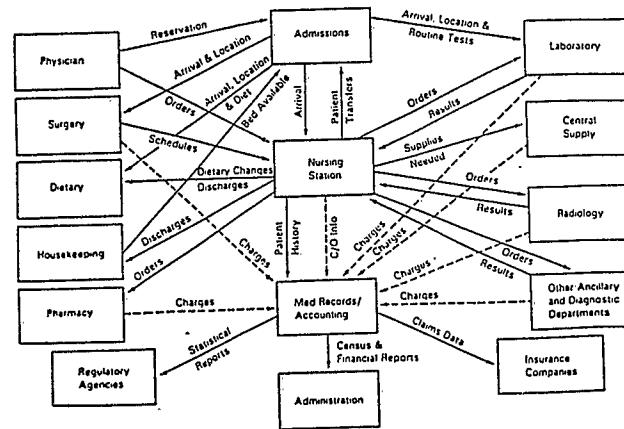
There have already been dozens of authoritative studies on information flows in hospitals and the following flow chart (FIGURE 1) is representative of many such simplistic diagrams.

All such studies, regardless of the degree of detail involved, identify the Patient Master Index (PMI) or register as the core data base on which patient-related systems rely and the Admissions system as the key system in the generation of requests to a wide range of resource centres.

Provision of the PMI, the Admissions system and then an Appointment Scheduling system have been clearly identified by all RGH's as being the correct sequence of systems implementation regardless of different priorities in our RGH's for other resource management systems.

The Appointment Scheduling System has ramifications beyond the hospital as outpatients are also scheduled to be visited or to attend appointments for diagnostic or treatment purposes by Branch Office staff. Branch Office staff seeking to establish a claimant's entitlement to compensation and treatment

FIGURE 1
Information Flow in a Hospital



also schedule patient appointments. Without such a central system and communications infrastructure, several service centres would arrange appointments for the same patient at the same time.

The current proposal establishes a basic infrastructure in which Order Entry, Result Reporting and Medical Record updating can link Nursing Stations to all hospital sections providing services.

To continue with the past practice of installing "stand-alone" systems in certain laboratories, stores sections and patient administration areas will perpetuate problems of duplicated and inconsistent records.

2.6 SYSTEM PROPOSALS

(i) IMPLEMENTATION PLAN

The Department's proposal was directed towards the acquisition of computers for installation in mainland RGHs. Those computing facilities were to provide for the progressive implementation of PCS applications in accordance with individual RGH needs.

Agreement has been reached with the RGHs on the replacement ADT system (PMI/Inpatient Management) and on the universal need for a comprehensive Outpatient Appointment Scheduling system. Other applications are under discussion with RGH managements. Priorities for PCS developments in 1986/87 will be reviewed by the RGHs in mid 1986.

The Department is cautious about the determination of information requirements and systems priorities in the absence of data analysis and while still unable to meet user requirements with computing hardware and applications development resources. The systems backlog is immense, e.g.

- The Strategic Plan for Health Computing in New Zealand 1986, quotes:
"...A Review of information systems requirements in March 1983 in the Palmerston North Hospital Board produced 585 possible computer applications." (page 6).
- the Stony Brook N.Y. hospital has installed 105 computing applications in five years.

Implementation of key PCS applications must proceed without delay. The concept of identifying the total information needs of the hospitals before proceeding with this proposal fails to take account of

- the extent of potential applications
- the range of priorities that would be developed in each hospital

The spectrum of potential hospital information systems is explored in Appendix 5.

2.7 OTHER OPTIONS

(i) CHOICE OF PCS

The paper on the Patient Care System proposal at Appendix 3 outlines the factors leading to the selection of the PCS/ADS product.

(ii) McDONNELL DOUGLAS/CDSA SYSTEM

McDonnell Douglas Automation (McAuto) provides a national hospital accounts processing service in the USA with computing complexes in St Louis and Los Angeles. Satellite communications link the centres and service numerous hospital clients. McAuto also offers a Total Hospital Information System (THIS) which has been in process of installation at Royal Melbourne Hospital since 1983.

McDonnell Douglas Information Systems, which has taken over CDSA in Australia, is understood to have offered a bureau service to certain Victorian hospitals pending their installation of in-house computing facilities.

The CDSA software, developed under the PICK operating system on SEQUEL mini computers, is incompatible with the DVA long-standing IBM software orientation.

2.8 COST EFFECTIVENESS

(i) COSTS

The various statements of project costs in the proposal and its supporting documentation are brought together for comparison at Appendix 2.

(ii) CONVERSION TO ANOTHER MAINFRAME

The technical problems of moving from IBM software compatibility to another architecture are insurmountable. While costs may be in the millions of dollars, the threat to the Department's Client Data Base, to the service to veterans and the loss of vital systems staff to other IBM users render the approach unthinkable.

SRI USA consultants assessed the cost of a change of the Client Data Base from IMS to another system at 25 staff years of effort with little practical advantage to DVA.

2.9 TECHNICAL CONSIDERATIONS

(i) TECHNICAL FRAMEWORK

Attachment "J" of the Ferris Norton report puts forward technology guidelines, accepted by the Department, for the implementation of Office Automation and Executive Support Systems.

The proposed implementation of PCS on IBM compatible equipment also meets these guidelines. The consultants recommend (in J.2.5) that "DVA should only install software and hardware that is compatible with IBM standardsto ensure the high level of compatibility that will be needed to provide users with a single systems view".

The consultants' advice (J.01) was that:

"Departure from these guidelines will incur costs within the Department in terms of personnel, operation of equipment and increased risk of failure to achieve the desired benefits".

Any technical limitations imposed on the Department by following these guidelines are more than offset by the benefits that will be achieved. There are no other options for the development of integrated hospital information systems which offer these same benefits.

2.10 POLICY CONSTRAINTS

(i) STAFFING

The considerable staffing resources that developed the current hospital ADT system are no longer available. They have been assigned for some years to the development and maintenance of the Department's primary systems supporting compensation and benefits and other systems priorities.

PCS/ADS offers the opportunity for a large range of integrated systems activity to be initiated in the RGHs with limited systems resources. Reliance is placed on the user areas which are to benefit from PCS systems development and on IBM and third party support.

The requirement for RGH computer operations staff and NCC-based control and support staff was stated in the new Policy Proposal (refer to 2.4(ii)).

2.11 ACTION PLAN

(i) EARLY HARDWARE DELIVERY

IBM and National Advanced Systems provide suitable hardware. Each company has indicated that delivery of an IBM 4381-type facility could be made inside two months from receipt of order.

Delivery of computers for Heidelberg and Greenslopes in 1986/87 would not necessarily call for such short delivery times.

(ii) SECOND HAND HARDWARE

Initial discussions have been held with DOLGAS and no indication was given of MVS/XA capable machines becoming available from other departments.

The Department's delivery timescale can be met by the two likely tenderers. Funding has been on the basis of new equipment acquisition although the option of leasing is still open.

(iii) REMOTE ACCESS FOR PCS OPERATION

The action plan needs to be redeveloped to take account of the JPCPA hearing date.

Slippage in the hospital installation of the RGH Concord and Heidelberg computers to October and November 1986 respectively (though early installation in an alternative Sydney site is proposed) necessitates a re-evaluation of remote operations.

The Department is looking at a number of options to provide a PCS service to Daw Park and Hollywood ahead of the installation of their facilities.

The need for a pilot phase to cover remote operations arrangements is agreed.

(iv) NETWORK REQUIREMENTS

The need for a pilot phase ahead of remote operations to WA and SA is accepted. Options in regard to providing an early PCS service to those States are under review. Prospects exist for close liaison with State Health Departments on PCS implementation though no detailed plan has been formulated.

Appropriate staff from the RGHs are expected to attend at RGH Concord to participate in pilot exercises. With simulation of remote operations, a short pilot only is expected for remote operations arrangements.

The telecommunications data volume during remote operation of the PCS/ADT phase in SA and WA is not expected to exceed that of the present ADT system on the DVA network. Local computing facilities would be in place before the system expanded beyond PCS/ADT.

(v) PILOT PHASE DURATION

The first phase will replace the existing ADT system and, therefore, the 3 months allocated for pilot testing is expected to be sufficient. It is proposed to review the pilot testing phase after this 3 month period to determine the level of user acceptance and reaction. If extended testing is considered necessary, production running at the other RGH's will be delayed. Training and familiarisation activities at the other hospitals, however, need not be affected. On the information available, the proposed 3 months allocated is considered realistic. A longer period than this is likely to result in a negative reaction from RGH management and staff.

During each pilot testing phase, representatives from the two subsequent implementation sites will be

required to participate. This sharing of experience should result in a shorter pilot testing phase for the second and subsequent implementation sites for any given module.

(vi) STAFF AVAILABILITY

The central PCS team created in 1984 has been re-established with six systems staff, two implementation officers and a project manager. Hospitals will continue to make available PCS co-ordinating staff and liaison staff from potentially involved areas (e.g. appointments, nursing administration).

Implementation officers for the PCS Inpatient Management/ADT system are now being sought.

Substantial assistance will be required of IBM in support of PCS/ADT and the initial PCS applications. If IBM support is not forthcoming, six additional systems staff and a budget of \$300,000 p.a. for contractor assistance in systems engineering and applications development are estimated to be required.

(vii) HOSPITAL STAFF INVOLVEMENT

Hospital staff have been, and will continue to be, involved in this project. Contact with staff has been through:

- PCS Steering Committee
- PCS Co-ordinators Group
- continual liaison with test site management and staff
- presentations and discussion by PCS team members in all States
- initial PCS Team members recruited from RGH environment
- RGH Concord conducting their own review meetings on the PCS Project instigated by their ADP Manager/PCS Co-ordinator.
- PCS Hospital & Medical Computing Bulletin
- computer awareness courses run by PCS staff
- distribution of Minutes of the various meetings and comprehensive documentation to as wide an audience in B.O.s and RGHs as possible.

As outlined at B.2 (v) following, the proposal to conduct a hospital information model as a preliminary to the assessment of total information needs has been outlined to RGHs and State Deputy Commissioners.

RGH Daw Park, S.A. has offered to provide the wide range of professional staff required to build the first model. The level and manner of representation from other RGHs will be discussed further with hospital managements.

2.12 INDUSTRIAL ISSUES

(i) JOB IMPACT

A formal job impact study has not been done because the first module of PCS is intended to be merely a replacement of the current system. Job impact will be assessed during the trials and piloting of the software. ADT staff will be participating in those trials and contributing to the job impact study.

Staff Associations have been involved through the PCS Director's participation in the National Consultative Council meetings. It is intended that each planned application module will be subject to a discrete job impact study with only the relevant staff associations involved. This approach has been largely accepted by the various staff associations in the RGHs.

The PCS incremental applications approach does not lend itself to an overall job impact study as the process of systems implementation is continuous.

(ii) COMPUTER AWARENESS TRAINING

This is done through a PCS Hospital & Medical Computing Bulletin and the widespread dissemination of available information. The assistance of computer companies has been sought in regard to training/awareness material and the conduct of computer appreciation seminars on a wide scale.

An initial training framework has been developed and will be finalized when PCS software is available and user feedback is analysed.

2.13 INDUSTRY PARTICIPATION

(i) HOSPITAL SYSTEMS INVESTMENT

If what is being sought is a money figure for IBM investment, DVA does not have information to give a specific figure. However it is evident that local investment by IBM in adapting the PCS/PMI and Inpatient Management system to local requirements is considerable.

2.14 METHOD OF ACQUISITION

(i) NEW PURCHASE

Funds were sought and provisionally provided for new computer purchase in 1985/86 for RGH Concord.

Alternative funding arrangements were reviewed and may need to be considered again in regard to the computers for Heidelberg and Greenslopes.

(ii) LEASED SYSTEM

IBM have indicated that the company does not distinguish between lease or purchase in determining the level of marketing support to be made available to a customer.

The company also indicated that lease was for a fixed term and was unlikely to be economically attractive for less than 3 years. The five computers would be installed within that period.

(iii) ACQUISITION APPROACH

The Department is convinced that the PCS project requires the support and joint development effort of IBM as evidenced by other PCS users, to minimise risk and for cost effective implementation.

DVA believes that the project would be subject to considerable risk if DVA were possibly the only PCS client in the world without IBM hardware and, therefore were unable to:

- attract IBM professional support for systems software or PCS applications;
- join the ECHO PCS users' group;
- communicate with the PCS user community through the world-wide offices of IBM.
- participate in joint developments with IBM and Australian hospitals.

A Supply and Development Contract with IBM is the Department's preferred approach. It would embrace PCS/ADS support, PCS applications assistance in development and implementation and the provision of an IBM 4381 computing facility for installation at

Concord. Arrangements would also be sought for PCS application joint development with IBM in furthering the usefulness of the system.

Subsequent RGH computers could be the subject of open tendering with specific support requirements included.

The Patient Care System Proposal document provided at Appendix 3 sets out the arguments for IBM facilities at Concord in more detail.

2.15 CONSULTATION

(i) CO-ORDINATION COMMENTS

The PSE, DOLGAS and Finance generally supported the Proposal with Finance not convinced of the necessity for the first computer acquisition in the current year.

Refer to 2.1 (i) above where the NPP Co-ordination comments are reproduced.

Differences between funding figures contained in the proposal and in the DISC Report are reconciled at Appendix 2.

2.16 CONSEQUENCE OF NOT PROCEEDING

(i) PROBLEM AREAS

If the current system is kept, there will be (as there are now) maintenance problems due to the dependence on professional programmers for system amendments in COBOL and the limited remaining expertise in the ADT system. In addition:

- current staffing restraints mean there is no chance of major enhancements and/or add-ons to the current system;
- there is no "PMI" in the current system. Therefore, a medical record abstract (for example) may never be created, especially with the Cost Period stripping which now must occur;
- micro computer applications cannot be readily linked into the current system;

data cannot be easily manipulated to meet the current and changing needs of management. Any reports which are not of the standard, inflexible design, will continue to require manual collation.

- the past practice of installing "standalone" systems in laboratories, stores and patient administration areas will be perpetuated;
- some \$3m have been spent to date on "standalone" PRIME and Webster systems for cost effective applications;
- a further \$3m would be required over the next three years to provide similar facilities to the above areas in other RGHs;
- patients will continue to be adversely affected by inefficient admission test ordering and result and reporting procedures and by the labour intensive outpatient scheduling system;
- as Dr Brand detected (paragraph 28-29), the effect on hospital staff morale would be damaging. Quote:

"Generally speaking the hospitals have stagnated in their quest for improved data processing facilities. They have been continually told to wait - "the solution is just around the corner". They have waited and they continue to wait. The corner is never negotiated".

3.1 CORPORATE PLAN

(i) PLAN NOT AVAILABLE

DVA established a Corporate Management Branch in 1985 and has clearly identified the overall Mission and Goals of the Department, the various Programs to fulfill that Mission and the objectives of each program. The program structure is represented in Fig. 2.

A Committee has been established to design a Management Improvement Plan (MIP) as part of the Government's initiatives in the area of Financial Management Improvement Programs (FMIP). This committee includes representatives from Department of Finance and the Public Service Board who are involved in the exercise across the whole APS.

A Departmental Corporate Management Committee has been appointed to take over this work, to monitor progress towards corporate goals and to recommend strategies to address on-going production workloads, major new projects and management improvement activities.

3.2 JOB IMPACT STUDY REPORT

(i) RESULTS FOR PCS

A survey of overseas users of PCS compiled by the Western Australian Department of Health in late 1985 is at Appendix 6.

Refer also to 2.12 (i) above.

There will be some changes to work practices with a replacement ADT system, e.g.

- the currently written admission form will be replaced by a computer printed admission form.
- PMI registrations under PCS will have to be decentralized to areas not currently doing this function e.g. Admissions and Casualty.

However, the replacement ADT system, with the PMI, provides the foundation for the whole range of potential hospital computer applications identified at Appendix 5.

3.3 CONSULTANTS' REPORTS

(i) QUALIFICATIONS

The resumes of the consultants could be made available with their agreement. Consultants involved in both the Ferris Norton report and the Disc International report had excellent credentials and hands-on experience with large on-line computer systems. Their experience covered:

- real time high transaction rate data base systems;
- very large on-line networks with multiple processor sites;
- data base management systems;
- operations, programming and management of these systems;

- implementation of office systems in this environment;
- risk analysis of major complex system environments.

In addition, the chief consultant from Disc International has experience in State health and hospital computer systems analysis and implementation.

Both consultant groups interviewed a wide cross-section of hospital staff in several RGHs and involved the PCS team in the consulting project.

(ii) RISK ANALYSIS

A formal Risk Analysis regarding hospital computing has yet to be done. The Department has access to the computer modelling technique employed by Ferris Norton.

Hospital computer acquisition and PCS implementation are phased and adequate opportunities exist for project review.

(iii) STANDING OF ANALYSIS OF RELEVANT BRAND RECOMMENDATIONS

The analysis was prepared by Systems Division in the form of a submission to the Repatriation Commission which subsequently accepted it for incorporation in a program of on-going actions to remedy accepted faults in a defined timeframe.

(iv) OUTSIDE SERVICING

See also PCS (xiii) following.

Any data from these non-departmental sources would have to be keyed in, if required. Copies of test results done in outside laboratories are already attached to the clinical notes.

Details of service provided by private hospitals are provided to Branch Office as part of a claim for payment. Information judged to be significant is passed, as hard copy, to the hospital for inclusion in the hospital file on the patient. Such information could be passed electronically to the computerised Medical Record Abstract envisaged under PCS.

The task of accumulating on the RGH patient file all treatment information in respect of Veterans,

whether treatment was provided by RGHs, public and private hospitals and specialists, would be immense.

Considerable clinical information would be held on public hospital files and not normally released. The development of a comprehensive treatment file for all Veterans would not be cost effective.

(v) CLERICAL LOAD

Refer to PCS B.5 (xiv) following.

(vi) PRIVATE PRACTICE

Refer to PCS B.5 (xv) following.

(vii) MEDICAL RECORDS

This is incorrect. Involvement is on-going with both the Department's Consultant and hospital MRA's - especially at Concord and Heidelberg.

Medical Records Administrators are members of each RGH Steering Committee and the Medical Records Consultant attends Co-ordination Committee meetings on future system needs priorities.

(viii) NEED TO RECORD STAFF LEAVE AND TRAINING
TO SCHEDULE STAFF AND OUTPATIENTS

A Departmental Personnel and Pay Administration System (PAPAS) is under development. The module to record leave and training is scheduled for delivery in late 1986 but the priority of a further module for forward scheduling has yet to be established in relation to other system needs.

(ix) NEED TO COMMUNICATE TO HOSPITALS THE
BENEFITS OF DATA PROCESSING

Presentations on benefits of an integrated set of Hospital Information Systems (HIS) have been given on several occasions to all RGHs. Representatives from all RGHs attend Co-ordinating Committee meetings and regular bulletins are distributed to advise on direction and progress of PCS project.

RESPONSE TO ATTACHMENT B TO JPCPA MEMORANDUM

OF 12 FEBRUARY 1986

B.1 PROPOSAL CONTENT

(i) BOUNDARY OF PROPOSAL

As outlined at Appendix 5, more than one hundred computer applications in hospitals have been identified by a number of organisations. PCS/ADS provides an applications development tool for users. The world-wide PCS user community and third-party software suppliers contribute numerous solutions.

The DVA applications development and implementation plan will be conditioned by user needs and availability of solutions. Different needs will emerge between RGHs and can be accommodated. The proposed DVA plan of PCS development is at Appendix 7. It concentrates on agreed high priority tasks to follow the installation of the PMI/ADT system.

A configuration of the proposed RGH Concord equipment is at Appendix 1. The RGH computers will utilise present network links to the NCC. RGHs will be linked to each other through the NCC.

(ii) OA FUNCTIONS

Electronic messaging is provided to enable Order Entry from patient care areas (e.g. wards) and Result Reporting back from patient services areas (e.g. Pathology)

Integration of data from Medical Record Abstracts and P.M.I. with textual reports generated at W.P. workstations will reduce workloads in preparing such documents as Discharge Summaries.

(iii) SHOULD NOT THE PCS PROPOSAL INCLUDE OA
FACILITIES

Stand-alone P.C's are being introduced for W.P. which can later be connected in LANs for limited OA facilities or to a mainframe driven hospital network for full WP/DP/local processing data file extraction and transfer/etc., depending on strategies and priorities of each particular RGH.

Such initiatives are consistent with, but not essential to the PCS proposal. The Order Entry and Result Reporting facilities of PCS are in use overseas for electronic mail communication and avoidance of excessive paging of staff.

Resource constraints will result in the deferral of proposals, as in the FNA Report, for mainframe office support facilities in Branch Offices.

(iv) SOFTWARE ENVIRONMENT

PCS requires CICS/DL1 and IMS/DB. A major task in integrating the RGH systems with the NCC is the development of "bridges" between CICS/DL1 and IMS. Specialist consultant/contractor support will be required.

The installation of the DB2 relational data base management software on the RGH computers, interfaced with PCS/ADS, is under active consideration in a number of public hospitals. DVA will review the usefulness of DB2 as a tool for the development of an RGH corporate data base.

Installation of SPF, TSO, SAS and DISOSS is expected in early 1987 at Concord.

B.2 OVERALL STRATEGY

(i) STUDIES ON DATA FLOWS

Refer to responses at 2.5 (iii) above and B.2 (iv) and (v) following.

(ii) HAS STRATEGY BEEN CONSIDERED AT EXECUTIVE LEVEL.

Yes, by PCS Steering Committee and during presentations to senior staff at all RGH's.

(iii) WHAT PLANS AND PRIORITIES FOR LATER SYSTEMS.

Refer next question.

(iv) HAS REVIEW OF TOTAL COMPUTER NEEDS BEEN CARRIED OUT.

A feasibility study on the use of Information Engineering methodology has been conducted. The outputs from the feasibility study could be made available for review. The brief for consultants to

lead the HIS study will include the requirement to construct such an information model capable of ongoing modification as information needs are defined in increasing detail or are changed.

The brief is in draft form and, subject to staffing constraints, will be issued in March for the project to commence in April.

(v) HAS PROPOSAL BEEN EXPLAINED, WHAT RGH RESOURCES, WHAT COST.

The proposal has been outlined in visits to RGH's and at a meeting of all State Deputy Commissioners. The preferred scenario envisages that consultants will lead a one-week intensive training course on the methodology for up to 12 officers with expertise in all areas of hospital operations.

During this week an initial strategic model would emerge and during the balance of the project each member of the team would further develop the detail in his/her areas of the model on a part time basis.

RGH Daw Park, S.A., has offered to provide the wide range of professional staff required to build the first model but the level and manner of representation from other RGH's, B.O.'s and Central Office have yet to be decided.

The project has been estimated to take 3 to 4 months and to cost \$75,000 in consultant fees and expenses based on the S.A. location.

B.3 COSTS

(i) RELIABILITY OF BENEFIT SURVEY

Respondents have been extensively involved in the PCS project since early 1978/79.

The Benefits survey conducted in June 1985 was developed during site visits and discussions with RGH management in Victoria and Queensland.

The questions in the survey reflected known benefits reported by hospitals in U.S.A. using PCS. The resultant survey was trialled at RGH Concord and subsequently distributed to other RGH's. Heidelberg has almost 110% more outpatient visits than Concord resulting in a proportionally smaller potential benefit from reduction in average length of stay.

The survey was directed to the Medical Superintendent of each hospital who must be seen as a responsible manager and the most informed judge of hospital operations.

(ii) DATA ENTRY FOR PILOT IMPLEMENTATION

Planning of the pilot for the PMI/ADT system is at an early stage. Detailed discussions with IBM on the PCS product and with Royal Adelaide Hospital and the W.A. Health Department are scheduled for April 1986.

Entry of data will be undertaken by user area staff. Up to six staff may be involved at any time with an average of two user staff expected over a three month period. Some overtime costs will be incurred.

(iii) SECOND HAND EQUIPMENT

Refer to earlier responses at 2.11 and 2.14.

(iv) CENTRAL PCS BUREAU

A comprehensive cost/benefit analysis has not been produced.

Dr Brand (Chapter 28) has reinforced the Department's approach to the devolution of responsibility to hospitals in respect of computer systems and this management approach has been accepted by the Repatriation Commission.

Enquiries of other PCS users world-wide reveal that only one organisation of the 250 users of PCS - Sisters of Charity - operates a National PCS bureau. This is in the USA. Mainframes and all communications links are duplicated for backup.

However, the Department is not prepared to accept the risks associated with such an operation. An analysis of the costs of the central approach, if it was to provide the same level of service and security to PCS users, would reduce five year acquisition and operations costs by 10-15%, compared with the proposed decentralised approach.

No computer accommodation is available at the NCC for such a bureau. The risk associated with extending the scope of the NCC to accommodate two further mainframes - with all Departmental facilities at the same location - is not acceptable to the Department. A

second computer site, remote from the NCC, would need to be considered.

(v) COST COMPARISON

Refer to Appendix 2.

(vi) IBM'S STATEMENT OF SUPPORT

In the course of the Department's earlier attempt to redevelop the USA Inpatient Management System in 1984/85, IBM's support to PCS/ADS installed on the NCC AMDAHL was limited to normal software service of a licensed product.

Officers of the company have since indicated that further support from IBM is discretionary and depends largely on the return to IBM from the actual or prospective contract.

A recent statement by IBM on its Support Philosophy is at Appendix 8.

(vii) USE OF NON-IBM HARDWARE

In NSW the Health Department and large individual hospitals develop unique computer applications on predominantly Digital Equipment VAX computers.

Most health organisations in Australia, including the RGHs, are unable to provide the staffing resources for local system development and are coming to depend on vendors of information systems software.

DVA has used IBM-compatible facilities for almost twenty years. Its systems are constructed around IBM data base techniques and its communications accord with IBM developed standards. There is a high level of integration of systems between the benefits and treatments functions of DVA with Branches accessing clinical information and RGHs interrogating Client Data Base systems for patient eligibility, etc.

If RGHs were to acquire other than IBM-compatible equipment, the cost penalties would possibly exceed \$10 million over five years.

- existing IBM-trained support staff would need to be supplemented by some 10 further staff with expertise in the RGH hardware (\$3.2 million)

- additional hardware, software and skills would need to be acquired to develop, implement and maintain a complex link between incompatible communications systems and databases; if such was achievable (\$5 million).
- a number of existing systems would need to be converted to operate on new RGH facilities (\$1 million)
- most existing terminals, micro computers and cabling systems would need replacement (\$0.6 million)

If new non-IBM compatible facilities were acquired (e.g. DEC VAX), DVA would need to allocate resources to unique hospital systems development and support. A team of probably thirty systems staff would be needed to deliver new systems in a reasonable timescale (\$12 million over 5 years). A major systems development facility (\$4 million), as at NSW Health, may need to be established.

Unless an applications development tool such as PCS/ADS was available, users would continue to be constrained by inflexible system design, lack of systems integration and delay in systems delivery.

(viii) BENEFITS FROM CURRENT SYSTEMS

Refer to 2.5 (i) above.

B.4 PLANNING, MANAGEMENT

(i) JOB IMPACT STUDY

Refer to 2.12 above.

(ii) SYSTEM CONVERSION

Conversion of existing Systems will include the following activities:

- conversion of data on the existing Patient Status File - this will necessitate the design and program development of a conversion routine;
- new data collection must be undertaken to complete the Patient Master Index;

- extensive quality checking will need to be done of the conversion processes;
- the Client Data Base will need to be downloaded during the creation of the original PCS PMI data base. Both Veteran and Community Patient data would be downloaded;
- particular attention will need to be paid to the maintenance and integrity of statistical collections during the conversion;
- modification and enhancement of the PCS ADT system to meet RGH specific requirements has commenced;
- existing terminal equipment will be replaced with colour VDUs and where suitable relocated elsewhere in DVA.
- existing laboratory equipment connected to the NCC will still be used and will require an interface to the hospital computer along the lines of the existing interface.

(iii) PROTOTYPE PHASE

The Prototype phase will commence in April at RGH Concord, utilising the IBM PCS software and Department of Housing and Construction computer.

(iv) PILOT TESTING

Preliminary schedules have been designed for pilot testing. These schedules will be reviewed as the system development proceeds and will form the basis of monitoring activities. In addition, Project Management Software is being implemented and will be used to monitor all activities, including pilot testing.

Users will perform the pilot testing with assistance from the team and IBM. The PCS Liaison Officers from other RGHs will also participate.

It is intended that only a sample of Concord patients will be on the test data base. The number and type will be sufficient to test all functions of the System fully. It is felt that 2 months is sufficient for reviewing the pilot operation. However, delay in installation of the computer at RGH Concord - now not possible before September 1986 - will considerably extend the period and thoroughness of the pilot.

It is apparent that pilot phases at subsequent implementation sites will reflect the results of the first. The second implementation, at RGH Heidelberg, is not scheduled too soon after Concord provided that:

- the PCS Liaison Officer is employed well in advance of implementation;
- the PCS Liaison Officer participates in pilot testing at Concord. The system should be functioning successfully at Concord before implementing elsewhere. Training and familiarisation can proceed at the subsequent implementation sites well in advance of implementation.

(v) SYSTEM BACKUP

A DVA data communications network is currently in place. Links between the RGHs and the National Computer Centre in Sydney need to be maintained for access to central DVA systems and the Client Data Base.

RGHs will be linked to each other through the NCC-based network. Redesign of the network will be considered to take account of the computer installations in the RGHs as possible concentrators for the Branch Office terminals to the NCC. Additional line capacity and communications controllers are expected to be required for the B.O. to RGH links.

Expert advice will be sought when the successful mainframe tenderer/s is/are known. Any additional network costs are expected to be marginal.

On-line backup of RGH systems, through the maintenance of duplicated data bases at another RGH, is not expected to be cost effective. Back-up arrangements will be developed to accommodate extended system unavailability as at present. Use of similar computers and PCS-based systems will enable RGHs to develop progressively arrangements for mutual support and backup of vital systems at times of computer overload or limited duration outage.

(vi) RELATED HEALTH PROPOSALS

DVA has been briefed on systems strategies by the State health authorities in all 6 states. Strategic plans have been provided by N.S.W., Queensland and Western Australia.

There are major differences between States depending on the level of autonomy in information systems planning exercised by the larger hospitals.

The Western Australian system is seen to resemble the DVA position most closely with:

- emphasis on centrally co-ordinated information systems planning;
- policy of IBM compatibility
- need to replace existing, obsolescent ADP systems in hospitals.

However, Western Australian Hospital Information System planning is conditioned by the fact that almost all major hospitals are in the Perth metropolitan area. The provision of a responsive centrally-based mainframe service, therefore, is practicable in that State.

A copy of the New Zealand Strategic Plan for PCS hospital systems is to hand. Direct contact with NZ PCS staff will shortly be established.

The NZ PCS plan is ambitious. It includes the establishment of a national Patient Master Index. An implementation plan is reproduced at Appendix 5.2.

(vii) ADP OBJECTIVES

ADP Objectives and specific objectives of the proposal are stated at 2.2/2.3 (ii) and (iii) above. These objectives will be furthered by the installation of IBM's Patient Care System (PCS) running on a suitable IBM compatible computer installed at each mainland RGH.

The adoption of PCS will enable the building of a data base for patient care and management. Using various application modules, PCS is designed to collect patient data, keep them current and make them available on an on-line basis to personnel providing patient care.

Patient data are entered into the system as part of the outpatient or emergency room process, or during the inpatient pre-admission or admission process. Data are edited and forms, notices and schedules are displayed or printed at user defined locations throughout the RGH; examples of these locations are nursing stations, medical records, pharmacy, radiology and the hospital administration area.

(viii) ADVANTAGE TO HOSPITALS

The Department expects to achieve in its RGHs greatly improved co-ordination of activities in support of patient care. This will result from the creation of a patient data base, efficient communications and effective management and administrative systems.

The DISC Report, at page 19, identified the potential advantages to the RGHs as:

- development of a data base of patient information including basic clinical data.
- admission/discharge functions to facilitate collection of basic patient data.
- on-line entry of patient orders from nursing stations for patient services such as Pathology tests, diet changes, specialist therapy, X-rays etc.
- the optimal utilisation of scarce clinical and clerical support staff.
- on-line display of test results and status of patient orders.
- management information reports to be used for:
 - improving the placement of personnel in relation to actual workloads;
 - monitoring the use of consumables and services by hospital functions;
 - evaluating new capital proposals for specialised equipment, additional facilities etc;
 - budgeting, performance measuring etc.

Refer also to responses to 2.5 and 2.6 above.

(ix) DVA CORPORATE PLAN

Refer to response to 2.2/2.3(i) above

(x) STRATEGIC PLAN

Information on this proposal is covered in Sections 3.4.1 and 6.3 of the Department's draft 1986 Strategic Plan.

(xi) TWENTY FOUR HOUR OPERATIONS

RGH managements will be able to determine the operating hours of their computing facilities according to hospital needs.

The implementation of the patient data base and on-line order entry and result reporting requires reliable computing services. A remote central facility may not be sufficiently reliable owing to pressures to economise in its large-scale operation. The NCC provides reduced levels of service at weekends and no service at all is currently available between 11 pm and 7 am. It would be uneconomical for the NCC to provide a 24 hour service to the hospitals owing to the necessary but low systems usage in the third shift. Hospital computers could be unmanned during that shift.

(xii) IBM INVOLVEMENT

Officers of IBM have indicated that the level of support for PCS that would be provided, beyond normal software maintenance service, would typically be geared to the customer's commitment to IBM hardware. (Refer to Appendix 8).

While each RGH will require support with PCS application development and implementation, the need for expert and extensive assistance is acute at Concord which is the prime PCS development, test and pilot implementation site. Lack of IBM assistance at Concord will expose the project to high risk and implementation delay. The need for assistance at the other RGHs is not so critical, though ongoing support in PCS applications will be required by each RGH either from IBM or a third-party software supplier.

The acquisition timetable has been deferred beyond the Department's expectation. The IBM 3033 at the Department of Housing and Construction must be used for DVA's PCS in-patient management software enhancement until June 1986.

The RGH Concord computer site cannot be completed in time for computer delivery. The computer supplier will be required to accommodate the computer and provide network services to Concord until a site is available. That remote link will be adequate during PCS test and piloting phases from May to September 1986.

(xiii) DELIVERY TIMETABLE

There are two potential suppliers of IBM-compatible equipment of the required scale, viz., IBM and National Advanced Systems.

Both companies have indicated that a suitable configuration is available on short notice if an early intention to proceed is given.

B.5 PCS

(i) PCS ARCHITECTURE

Information from IBM is provided at Appendix 9. Technical publications can be made available, or a presentation arranged, if required.

The range of applications that can be developed in PCS/ADS and/or is applicable to hospital operations in Australia and overseas is outlined at Appendix 5. Many of these applications could be developed in COBOL and interfaced to PCS. Programming staff would be required for COBOL developments. The Department's current PCS application plan is shown at Appendix 7.

A number of microcomputer applications will continue to be developed by users.

Refer also to 2.5 (iii), 2.6 (i) and B.2 above.

(ii) OTHER USERS

Communication has been established between DVA and each State Health authority. DVA has fostered the communication of information technology strategies and plans between the States. Regular discussions take place with information management staff in NSW, Victoria, South Australia and Western Australia. Formal commitments to PCS are being negotiated by a number of States and information is held in confidence.

There is considerable interest in the prospect of an Australian PCS users' group affiliated with the world body.

(iii) IBM-DVA-RAH

IBM has contractual arrangements with Royal Adelaide Hospital (RAH) for the acquisition of RAH's earlier development of the PCS In-patient Management System and for consultancy and technical advice during

the current joint development. The arrangement also covers provision of computing services, accommodation, etc for the development team while based at RAH.

RAH will be installing the PCS in-patient management system as replacement for its version of PCS during 1986.

IBM and DVA have a Memorandum of Understanding covering DVA's contribution to the joint development and testing of the PCS In-Patient Management System.

IBM has outlined to the Department a possible role for DVA in the joint development of a future PCS Outpatient Appointment Scheduling Application. The Department has indicated its interest in taking a leading role in specifying a PCS OAS system. Future co-operation with IBM and IBM's support of DVA's use of PCS are expected to be addressed in a Supply and Development contract between the Commonwealth and the Company.

Officers of DVA and RAH have agreed to meet on a regular basis to exchange information and views on hospital systems development and implementation. Each expects to promote an "Australian" PCS users' group late in 1986.

The PCS In-Patient Management System is to be a fully supported, licensed software product marketed by IBM.

(iv) RESPONSIBILITIES OF PCS TEAM

No reduction in staff required in the PCS Central Co-ordinating team over the next 5 years is envisaged. If the current schedule is met, the modules anticipated at this stage (Inpatient Management, Outpatient Scheduling, Medical Records Abstracts, Pharmacy Management, Stores Inventory Management) will have been implemented in all hospitals by 1989. By that time, it is expected that additional user requirements will have been identified, particularly by the larger hospitals. The PCS team would continue to assist in identifying information requirements, evaluating available software and developing and implementing further applications modules. The PCS team would also be well-equipped in skills, experience and knowledge of the systems and the hospital environment to support centrally the PCS modules implemented in the RGHs.

Development work will include:

- analysis of current system functions;
- design, program development and testing of add-on functions, including Infection Control, Food Services, Emergency Accident Centre, Statistical Services, and other reports, Nursing Load, Ward Management;
- analysis, design, program development and testing of future modules, including Outpatient Appointment Scheduling, Medical Records Abstracts;
- development of systems documentation.

Other responsibilities of the PCS project team will include:

- "beta" testing of AIMS (the IBM Inpatient Management System)
- pilot testing of the DVA tailored version of AIMS and subsequent modules;
- resolution of technical problems;
- quality assurance activities;
- creation of test data;
- conversion from existing systems
- support of implemented modules;
- evaluation of PCS software when available
- liaison with NCC and Systems Division staff regarding the impact of new or modified central systems on hospital systems;
- amendments to interfaces between hospital systems and central systems where this becomes necessary;
- liaison with NCC and Systems Division staff regarding network considerations;
- liaison with hospital staff and suppliers regarding hardware installation;
- modification of implemented modules where this proves necessary;
- user training of hospital staff and of PCS Liaison Officers;

- provision of user manuals;
- user support after implementation i.e. provide Help Desk facilities for local and interstate staff;
- analysis of conversion exercise to cover all aspects of conversion from current system to new system, including:
 - setting up of patient data base;
 - transfer of necessary data between the hospital systems and central systems;
 - setting up of support data bases such as doctor database, user profile database, word database, ICD9 database,
 - change-over co-ordination;
- monitoring of the operation of local computer facilities;
- co-ordination of change control facilities.

B.5 (v) IBM SKILLS AND SUPPORT

IBM has a large health industry group in the U.S. which is complemented by an Australian group.

Three American groups with a total of 76 staff provide assistance to users in the areas of strategy development, technical support, world-wide support for IBM products, application development, installing/tailoring IBM application models to particular user needs and training and educating users. In addition to this group there are 25 health industry specialists in the US and several hundred systems engineers with experience in hospital applications.

In Australia, the IBM Health Industry Centre has over 30 staff located in major centres of activity with centralised management in Sydney. The Centre also includes a Senior Industry Specialist who is resident in America but managed from Sydney. He has extensive experience in a large number of U.S hospitals and:

- responds to requests for technical data on IBM software and its use;
- arranges visits of Australian customers and staff to leading US hospitals and IBM facilities; and

ensures that state-of-the-art information flows to Australia.

Just as the American group supports the ECHO group of over 900 hospitals and health oriented institutions with installed IBM systems, the Australian Group co-ordinates communication within the region of Australia, NZ and Singapore and with the U.S. ECHO, the PCS users' group, is a major disseminator of information and application software to its members. The same exchange to and between IBM systems users in this region can be expected.

IBM has advised that it will maintain and correct any identified faults in their proprietary products, such as the In Patient Management system. Subsequent developments by DVA of modules addressing our unique requirements (i.e. Infection Control, Food Services) will be maintained by the central DVA team with IBM assistance if IBM hardware is in use, provided the structure of the patient data base has not been changed. Any modifications to screens, reports etc. made at hospitals to reflect their own needs will be maintained by that hospital.

(vi) IBM'S SUPPORT OF PCS IN THE PAST

Since 1979 the Department has used IBM-compatible computers supplied by AMDAHL. IBM reduced its interest in DVA's computer activity from that time.

Until 1985, IBM apparently did not target the health industry in Australia. The Department has noted over the last twelve months a major new initiative and investment in resources and PCS applications software. Numerous health specialists have been recruited and a Health Industry Centre established.

It is assumed that IBM now sees a marketing opportunity with the Department's commitment to PCS. We are advised that all except one or two of the 250 users of PCS have IBM mainframes.

While the Department's recent association with IBM on joint development of the PCS In-patient Management System has provided the Department with useful skills and an insight into the PCS software, IBM has also gained through the design and development assistance provided by DVA/RGH staff.

DVA is under no obligation to acquire facilities from IBM and IBM is reimbursing the Commonwealth for the resources applied to the joint development.

(vii) PCS MODIFICATION

The Australian version of the PCS Inpatient management System, incorporating the patient data base (PDI) and ADT system, will be made available progressively to DVA for review during March and April.

A draft document has been prepared by DVA detailing the enhancements and modifications required to meet RGH needs. This document includes enhancements and modifications identified at the PCS Co-ordinators' Meeting held on 30-31 January 1986.

The IBM Inpatient Management (AIMS) functions have been compared with those of the current system and enhancements have been identified. Modifications will be made to the AIMS software, documentation and user manuals to reflect the changes identified. Any new modules required will be designed, coded and tested by DVA.

Analyses were completed early in 1985 of the add-on systems which include Food Services, Infection Control, Emergency Accident Centre, Nursing Loads, Ward Management and statistical and other reports. These analysis documents are currently being reviewed and modified to reflect changes in the existing system, the AIMS development project and any additional user requirements.

(viii) TRENDS IN HOSPITAL COMPUTING

On the basis of its ongoing contact with State Health Departments and hospitals, the Department expects that PCS will be installed in large hospitals in four Australian States during 1986/87. Information has been received in confidence in most instances.

All State health authorities have informed the Department of their planning towards

- integrated hospital information systems
- acquisition of software facilities for applications development by users (except N.S.W.)
- acquisition of applications software solutions, rather than the conversion of existing systems or in-house system development, (except N.S.W. which has a central software development facility)

(ix) HOSPITAL EXPERIENCE IN PCS TEAM

The existing ADT system was originally implemented for use by RGH Concord in the early 1970s. The level of detailed technical knowledge of the system is very limited within the Systems Division in Central Office. However, hospital staff who have made extensive use of the system have been seconded to the PCS team for extended periods.

Through the assistance of such staff, the PCS team now has a good working knowledge of current systems. All members of the team have spent time in relevant areas of the Concord hospital. In particular, there has been extensive study of the admissions area to observe its functions, the use of the current system and the problems encountered by the hospital staff in using the system. Knowledge of hospital-based computer systems formed part of the selection criteria for several of the positions within the team.

The team is drawing on staff from relevant areas for detailed knowledge, particularly from nursing, medical records, outpatients and admissions.

(x) SYSTEM DEVELOPMENT COSTS

Approximately three staff years of DVA effort (\$150,000 with overheads) was applied in the Department's attempt at producing an RGH derivative of the USA PCS In-patient Management System in 1984/85. A significant proportion of that effort was lost.

Participation of three DVA staff in PCS in-patient management development with IBM and Royal Adelaide Hospital has involved relocation expenses of almost \$20,000 but payment by IBM of \$35,000 (to Consolidated Revenue) for DVA effort applied.

A further \$15,000 in salaries and overheads may be expended by DVA, and recovered from IBM, for PCS in-patient system testing in 1986.

DVA expects to have 60 staff months of PCS systems development staffing resource available during 1986. Of that resource, 28 Staff months are expected to be required for PCS In-patient Management development to meet RGH requirements at a cost, with overheads, of \$117,000.

The current DVA ADT system took 65 staff years of effort to develop. DVA does not have the resources,

skills or staffing flexibility to create the equivalent of a PCS Patient Master Index in an acceptable timeframe.

(xi) PCS USERS WITH NON-IBM COMPUTERS

No PCS users in Australasia (i.e. including New Zealand and Singapore) have IBM plug-compatible computers.

Enquiries reveal that one or two of the 250 overseas users of PCS have IBM-compatible computers installed.

(xii) ALTERNATIVES

The Department initiated a conversion of the U.S.A. developed PMS module of IBM's PCS product in 1984 to produce a Patient Master Index data base and Admissions, Discharges and Transfers application module. The task was beyond the Department's skill and resource levels and was terminated in early 1985.

The Department has since sought to influence the PMI/ADT development by IBM Australia towards RGH requirements and to participate in the development to upgrade PCS skills.

CDSA has developed local software products in conjunction with (mainly) Victorian hospitals, using the PICK language and Sequel mini computers. Other non-IBM hospital systems have also been developed in Australia, but with limited commercial success.

The NSW Health Department has a strategy of developing standard software solutions for State hospitals using standard mini computers.

It is understood that the McAuto THIS hospital software has been undergoing adaptation for use at Royal Melbourne Hospital for two years.

The HIMAS system developed by Infohealth has been successfully marketed to smaller hospitals. While optional functions are available, it is understood that the RPG II language imposes rigid solutions once the system is installed.

Conversion of any of the above systems to meet DVA requirements and established IBM orientation is expected to be so difficult and expensive as to be virtually impracticable.

(xiii) NON-RGH PATIENT SERVICING

Refer also to 3.3 (iv) above.

The Department maintains a Medical File on all Veteran clients, in paper form, in the Branch Offices. The Hospital File (or Clinical Record) is a subset of that File.

Creating a complete Clinical Record for a patient through PCS would be an immense task and would not be cost effective. Hospital file summaries would need to be obtained from other hospitals and clinical records obtained from specialists, medical officers etc.

Adequate information for DVA's purposes is accumulated through the Treatment Accounts System, which is in the process of being automated, from the present Patient Status File and from clinical records released to Branch Offices by the RGHs.

The problem of releasing RGH clinical record files to the Branch Offices is being addressed. The construction of a computer-based medical abstract for on-line use by Branches and the RGHs could reduce the need for hospital files to be removed from the RGHs. An on-line medical abstract could also reduce delays in attending to patients at clinics when the paper clinical file is unavailable. Study of the opportunities for the creation of a computer medical abstract is continuing.

(xiv) CLERICAL LOAD

The admission and discharge of patients and the scheduling and management of outpatient appointments impose heavy clerical workloads in the RGHs. Overseas experience is that PCS is most useful in addressing labour intensive clerical and administrative tasks.

Clerical workload can be reduced with PCS through the institution of the patient data base, improved communications throughout the PCS user community and the automation of complex manual scheduling procedures.

While PCS will not initially impact on staff workloads with the new ADT system, its extension to nursing stations and laboratories for on-line ordering of tests and services, and result reporting will reduce clerical workloads.

Considerable productivity improvement is anticipated with a PCS-based scheduling system on the basis of reviews performed to date. Clerical staff will be involved in the Systems Requirements Definition for the PCS system for outpatient scheduling.

(xv) BILLING SYSTEMS

There is an emerging need for a Billing System within PCS in the RGHs. Requirements have yet to be specified. It is considered that other PCS users could have a similar systems requirement to address the Right of Private Practice.

The Department will be discussing the need for a PCS Billing System with IBM at a PCS review meeting during March. IBM will be encouraged to develop a system that is suited to Australian circumstances.

B.6 COMMUNICATIONS

(i) COMMUNICATIONS ACQUISITIONS

The RGH computers must be incorporated into the existing DVA network to ensure communications with central systems and maintenance of NCC data bases. RGH/RGH and RGH/Branch Office links need to be continued.

Front End Processors (FEP) are to be acquired to connect to the existing Amdahl 4705 at the NCC. Specialist network design advice will be sought from the RGH computer supplier on the connection and programming of these FEPs.

Refer to 2.4 (i) above for further information.

(ii) INTEGRATION WITH CURRENT NETWORK

The proposed network is an extension of the existing NCC network. Each RGH may be an appropriate domain, with the whole multi-domain network managed from a Central Network Control Centre at the NCC.

The RGH systems will need access to current information stored on the NCC machine (i.e. CDB).

(iii) OPERATIONS BACKUP

It is apparent that hardware reliability in overseas PCS installations is very high. DVA is confident that twenty-four hour operations can be reliably maintained at the RGHs.

Procedures currently exist to protect hospital systems from hardware and telecommunication failures. Procedures will also be developed to take account of hospital computer outages and failure of links to the NCC.

During short periods of system unavailability, (usually for less than a day) computer access to update data bases or to enquire as to eligibility will be suspended. Input may be batched when the system again becomes available.

Where order entry of tests, reporting of results or access to medical record abstracts is disrupted, manual processes will be available so that patient care levels are maintained.

The management of outpatient scheduling will proceed on the basis of hard copy daily status reports of scheduled services.

It will be an important feature of pilot testing to ensure that essential hospital services can be sustained during a period of hardware failure. Recovery procedures must also be in place. DVA will liaise with other PCS users in Australia and overseas on the techniques that have already been developed.

For extended outages, communication may be available through the FEP to the DVA network and to other RGH computing facilities. The PMI will be archived at least on a daily basis in each RGH and a copy would be available for mounting on another RGH computer.

By restricting the workload at the other site, a basic ADT system should be able to be established. There are no known technical problems in providing a PCS service to another hospital, if capacity is available and telecommunication links can be maintained.

The Department does not under-estimate the complexity of arranging suitable backup to RGH operations, internally through alternative procedures

and externally with links to other RGHs. The pilot PCS implementation phase in each RGH is expected to provide adequate opportunity to arrive at and establish adequate backup procedures for initial PCS operations.

(iv) BACKUP TO ANOTHER SITE

Effective backup to another RGH site will depend on the availability of the telecommunication link, adequate computing capacity and transfer of the patient data base.

It is considered that an RGH could service the ADT/PMI needs of another RGH for a period by suspending or rescheduling non-urgent processing tasks.

The steps in arranging such backup could be determined in detail during a pilot PCS implementation using remote RGH facilities. PCS bureau services are provided overseas and their operating procedures could be of interest.

(v) NETWORK COSTS

Refer to response to B.4 (v) above.

(vi) INTEGRATION OF DATA, TEXT ETC.

DVA updates its corporate data bases and paper files with a wide range of data originating from medical, para medical and clerical staff and from a range of digital and analogue instrumentation.

The effectiveness of that corporate information depends on its accessibility to authorised staff in Central and Branch Offices and RGHs. There is an ongoing evaluation of cost effective means of capturing a range of data and making it available through the computer system.

The Department does not have the skills or resources to perform a complex systems integration role. Technology selected needs to conform to IBM standards and protocols to permit integration of data with the IMS Client Data Base and PCS Patient Master Index.

(vii) BACKUP THROUGH DECENTRALISATION

The failure of one RGH computer, for an extended period, will not seriously impact on patient care or services in other RGHs or affect the processing of benefits and other central systems.

Provided the communications system is intact, an RGH could service the ADT/PMI needs of another that had experienced prolonged computer failure. That flexibility would not necessarily be available if the RGHs were serviced from a central bureau.

The existing DVA network is expected to be adequate for the provision of a remote PCS/ADT service to an RGH during an extended period of computer failure.

(viii) ADVANCED TECHNOLOGY

The only aspect of the Department's proposal that could be considered Advanced Technology is the interfacing of the IBM Client Data Base with the PCS system through the DVA network.

While specialist communications and data base assistance is required, there is no indication that the bridge between the data bases poses any significant technological risk or challenge. IBM has reviewed the task with the Department a number of times over the past four years.

Office automation is not specifically included in the RGH computer proposal. Refer to responses to B.1 (ii) and (iii) above.

(ix) AUXILIARY HOSPITALS

- Lady Davidson Hospital, Turramurra, has been connected recently to the network to access the CDB. NSW RALAC is awaiting connection.
- Access to the PCS Patient Master Index will be arranged.

B.7 STAFFING

(i) RGH STAFF

ROLE OF TECHNICAL STAFF

Technical staff will be required at each RGH to:

- manage computing facilities, including liaison on maintenance services with suppliers of hardware;
- support computer operations and liaise with NCC specialist support staff;

provide PCS/ADS programming support and user training;

assist with systems analysis and programming of PCS applications;

provide systems advice and undertake minor PCS application development and modification.

It is expected that each mainland RGH will need an officer at CS03 ahead of computer installation and a CS02 from the date of computer installation to address the above tasks. Little growth beyond that level of PCS technical staffing is envisaged provided the central PCS Project Team and NCC support services are maintained.

At this time, ADP support staff are based only at the larger RGHs. Their range of skills varies, with most coming from non-technical backgrounds (refer Brand Report 28.13, page 188).

The current ADP staffing level at the RGHs is as follows:

RGH Concord: 4 staff
Clerical/Admin: 1 x Class 8;
3 x Class 6

RGH Heidelberg: 2 staff
Clerical/Admin: 1 x Class 8;
1 x Class 6

RGH Greenslopes: 3 staff
Clerical/Admin: 1 x Class 8;
1 x Class 6;
1 x Class 4

RGH Hollywood: No staff
Positions of CS02; 2 x Class 6; 1 x CA4 established but not yet filled.
Supported by Biomedical Engineering and from W.A. Branch office

RGH Daw Park and
RGH Hobart: No staff
Supported by S.A. and TAS. Branch Offices respectively

RGH ADP staff presently undertake the following tasks:

Manage on-site ADP equipment, including:

- installation of terminals;
- arranging of maintenance by suppliers;
- arranging of cabling installation by Housing and Construction;
- Review applications problems and liaise with Branch Office, Central Office project or programming staff and the NCC as appropriate;
- Conduct in-house training on hardware and systems use. Co-ordinate and arrange external ADP training;
- Co-ordinate requests for equipment and prepare financial estimates. Purchase consumables;
- Assist end users in the preparation of systems proposals and in liaison with Central Office planning, Information Centre and facilities acquisition staff.

(ii) OTHER STATES IMPLEMENTATION

The latest PCS Co-ordinators' meeting indicated a positive attitude towards PCS by all RGHs. While the RGH Hobart hospital is possibly too small for efficient PCS usage, it is important that the same system be installed in each RGH for co-ordinated PCS development and support.

The major, foreseeable implementation problem is delay in extending PCS to all States:

- delays in acquisition of hardware will disrupt implementation plans, affect morale and may lead to unco-ordinated PCS application implementation;
- protracted implementation of the PCS ADT system will necessitate continued maintenance of the present ADT system. The Department will look to co-operation with appropriate State health authorities and hospitals that choose PCS, so that pilot implementation might proceed ahead of RGH computer installation in South Australia and Western Australia.

Use of the Concord and Heidelberg computers for pilot tasks in other States is also an option. Early acquisition of computers for RGHs Daw Park and Hollywood under leasing arrangements will also be considered if purchase arrangements are to result in significant delays to PCS implementation.

(iii) DISC RECOMMENDATIONS ON PILOT

Yes. Refer to response to 2.4 (ii) above.

Each hospital may develop PCS/ADS applications and screen formats. Developments will be co-ordinated by the central PCS team.

The structure of the PMI data base must not be changed or an incompatible PCS implementation will result.

(iv) USER AND STAFF ASSOCIATION INVOLVEMENT

Refer to responses to 2.12 (i) and B.4 (iv) above.

(v) ADVICE TO AFFECTED STAFF

Refer to responses to 2.11 (vii) and 2.12 (i) above.

(vi) ADP STAFF AND SKILL REQUIREMENTS

Refer to responses to 2.4 (ii), 2.10 (i), 2.11 (vi) and B.7 (i).

(vii) STAFFING LEVEL CONSTRAINTS

Staff must be provided by the RGHs for:

- PCS support and computer operations (refer to response to B.7 (i));
- PCS liaison, implementation and application maintenance;
- system piloting and data conversion;
- user training in PCS/ADS programming.

Objectives of the proposed systems could be affected by AOSL constraints and the availability of overtime funds for staff training and user involvement in new system testing and implementation.

Refer also to response to 2.11 (vi)

B.7 (viii) STAFF ASSOCIATION INVOLVEMENT

All staff associations with members in DVA hospitals have been kept informed of plans and progress at Federal Office level. Local representatives in hospitals have been involved in specifying required features of new systems in their area and of evaluating available products.

To date, evaluation has been confined to clerical staff looking at the replacement Admissions system and Pathologists looking at a PCS system developed by a private pathology bureau in Brisbane.

As the extension of access to systems such as Admissions into wards is considered, representatives of Nurses will become involved. Similar arrangements will be made in regard to HEFA members in areas such as Food Services.

(ix) HOSPITAL STAFF TRAINING AND AWARENESS

Refer to responses to 2.11 (v), (vi), (vii) and 2.12 (ii) above.

B.8 OTHER

(i) CPU USAGE CHART

No CPU Chart is available. The number and variety of potential PCS application modules (refer Appendix 5) make the derivation of a comprehensive chart difficult.

The Department is guided in its IBM 4381-type selection by the experience of RAH, the advice of IBM and the overseas experience outlined at Appendix 6.

Refer also to B.8 (vi) below.

(ii) CLOSURE OF CENTRAL PCS BUREAU

It is expected that the Commonwealth would have no reason to provide a computing bureau service to State hospital authorities.

There is no evidence of State co-operation in hospital management such as to sustain a central bureau providing computing services to a limited number of previously Repatriation hospitals within the State systems.

(iii) AMDAHL SUPPORT FOR MVS

Support is available from AMDAHL for MVS/XA. Experience is, of course, conditioned by the few AMDAHL MVS sites in Australia compared to large IBM sites.

There is no reason why NCC MVS support staff should not participate in the implementation of MVS/XA on the RGH Concord computer. With the slippage in RGH computer acquisition, it is now possible that the MVS/XA implementation on the NCC AMDAHL will occur first.

(iv) WHAT HAS BEEN DONE TO RESOLVE PROBLEMS IN DISC REPORT.

Senior management commitment is illustrated by the strong support for this proposal.

There has been a clear commitment to providing staff for a strong central development team and funds for consultancies and travel to ensure input from all RGHs, within budgetary constraints.

A much clearer understanding by hospital staff has been achieved through presentations over the past year and by the recognition that stand alone systems are not providing quick response to information transfer needs.

The major impediment to a better understanding of PCS by users and any lack of consensus between Central Office, Branch Office and hospitals is the lack of equipment on which to demonstrate the capabilities of PCS.

(v) STANDING OF THE BRAND RECOMMENDATIONS

Refer to response to 3.3(iii) above.

(vi) IS IBM 4381 COMPUTER SUFFICIENTLY POWERFUL?

Stony Brook Hospital N.Y. is probably the most computerised hospital in the world. It was opened in 1980 and computer technology introduced and extended

as an essential tool for the conduct of an efficient business and the achievement of maximum cost avoidance.

Over one hundred applications have been installed in five years. These are based on IBM's PCS/ADS and embrace the functions of

- Admissions, Discharges and Transfers
- Nursing Station Support
- Laboratory/Paramedical Support
- Financial Management
- Administration
- General Services
- Outpatient Department.

Refer to Visit Report at Appendix 6.2. The current computer is said to be running at less than 40% utilisation.

The University of Iowa hospitals have about 20 PCS modules supporting 3,500 users on its production IBM 3081-D mainframe computer. RGH Concord has 2,500 staff of whom approximately 1,000 could be considered eventual PCS users. A 3081-D is rated at 10 mips. As a guideline, Concord would need approximately 10/3.5 or 2.85 mips to support a similar number of modules.

The current model 4381-2 is rated at approx. 3 mips and is upgradable to a model 3 rated at approximately 4.5 mips. Concord is unlikely to have 20 PCS modules developed within 5 years so, even allowing for operating system overheads, the 4381 range is considered suitable for the expected medium/long term development path.

Consultations with IBM and Royal Adelaide Hospital (a one thousand bed hospital with an IBM 4381-1 installed) convince the Department that the 4381 range of computers is adequate to the needs of the RGHs for the next five years.

PROPOSED R G H CONCORD COMPUTER

HARDWARE REQUIREMENTS AND CONFIGURATION

Contents:

- 1.1 Proposed RGH Concord Configuration Chart
- 1.2 Summary of Proposed IBM Hardware Configuration - RGH Concord

SUMMARY OF PROPOSED IBM HARDWARE CONFIGURATION-RGH CONCORD

Processor:

1 x 4381-P02 Group 2 Processor, 16mb Main Memory
1 x 4381-1870 Additional Block Mux. channels
1 x 4381-1480 Book Rack
1 x 4381-1550 Console Table
1 x 3278-A02 Console Display
1 x 3278-4632 Keyboard
1 x 3278-6340 Security Keylock

DASD Sub-System (10 Gigabytes):

2 x 3880-3 Disc Control Units
2 x 3380-AD4 Disc Drives
2 x 3380-BD4 Disc Drives

Magnetic Tape Sub-System:

1 x 3480-A22 Tape Control Unit
1 x 3480-B22 Magnetic Tape Unit (Contains 2 drives)

Communications FEP:

1 x 3725-2 Comms. Controller
1 x 3725-1561 Channel Adapter
1 x 3727-70H Operator Console
1 x 3725-4911 Line Interface Coupler Type 1
2 x 3725 Line Interface Coupler Type 3

Line Printer:

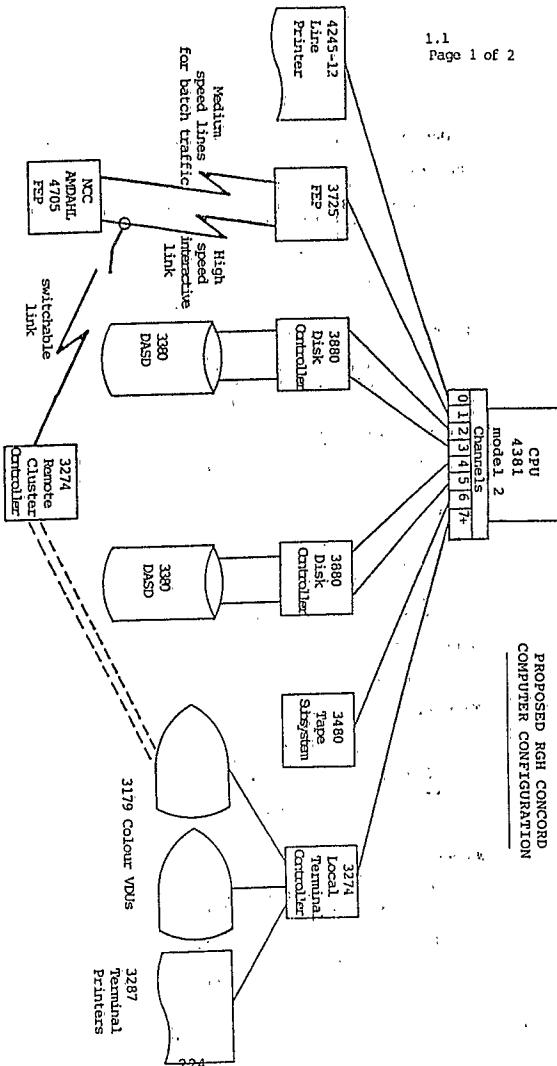
1 x 4245-012 High Speed Line Printer

Terminal Sub-System:

4 x 3274-A41 local SNA Terminal Control Units
x 3299 Multiplexor Support (no. to be confirmed)
15 x 3179 Colour Display Terminals
15 x Keyboards
5 x 3287-2 Printers

Notes:

- 1) Appropriate cabling for all of the equipment will be required for delivery with the equipment.
- 2) Other items, e.g. 3044 channel link extenders or 3299 cable multiplexors may also be required when final site planning is undertaken.



NOTES:

- 1) IBM model numbers have been used. Plug Compatible vendor configurations vary in model number only
- 2) Basic configuration to be installed in each mainline RGH. CPU model, amount of DASD etc. dependant on RGH size.
- 3) Remote Cluster Controllers will provide backup connection for PCS terminals to alternative site.

APPENDIX 2

APPENDIX 2

Table 2.1

**REPATRIATION HOSPITALS - COMPUTING FACILITIES
NEW POLICY PROPOSAL - FEBRUARY 1985
STATEMENT OF RESOURCE REQUIREMENTS**

CONTENTS :

2.1 NEW POLICY PROPOSAL - FEBRUARY 1985
STATEMENT OF RESOURCE REQUIREMENTS - DEC 1984 PRICES

2.2 NEW POLICY PROPOSAL - HARDWARE COSTS INCREASED
BY 10 PERCENT TO TAKE ACCOUNT OF EXCHANGE RATE
MOVEMENT TO AUGUST 1985

2.3 COMPARISON OF COST ESTIMATES - N P P COSTS AND
PCS PROJECT COST ESTIMATES BY DISC INTERNATIONAL
CONSULTANTS

2.4 RGH CONCORD - PROPOSED CONFIGURATION COST
ESTIMATES - 1985/86 expenditure

	<u>1985/86</u> \$m	<u>1986/87</u> \$m	<u>1987/88</u> \$m	<u>1988/89</u> \$m
RGH Concord				
Hardware	1.8			
Site Prepn.	.3			
Software and	.3			
Maintenance				
RGH Heidelberg				
Hardware	1.6			
Site Prepn.	.3			
Software and	.5			
Maintenance				
RGH Greenslopes				
Hardware	1.2			
Site Prepn.	.3			
Software and	.2			
Maintenance				
RGH Hollywood				
Hardware)				1.6
Site Prepn.)				
Software and)				
Maintenance)				
RGH Daw Park				
Hardware)				1.5
Site Prepn.)				
Software and)				
Maintenance)				
RGH Hobart				
Terminal				
Equipment				.2
<u>Sub Total</u>	<u>\$2.4m</u>	<u>\$4.1m</u>	<u>\$3.1m</u>	<u>\$0.2m</u>
<u>Total</u>	<u>\$9.8m</u>			

.../2

Table 2.2

Plus RGH Operations				
Staff Costs	0.05	0.1	0.20	0.25
(\$50,000 p.a. each RGH)				
Plus NCC Specialist Support Staff Costs	0.10	0.15	0.20	0.25

Notes:

- (1) The New Policy Proposal was for "reliable, responsive computing facilities at a program cost of \$9.8m over four years". (December 1984 prices). It was not an NPP in respect of the PCS Project.
- (2) August 1985 Department of Finance advised that the \$2.4m for RGH Concord was increased to \$2.6m to take account of currency fluctuations.
- (3) The NPP stated that software licences, maintenance services and increments to facilities after the initial financial year of installation would be met through appropriations. The following information was prepared in March 1985 in response to queries by the Dept. of Finance on the level of ongoing expenditure.

	86/87	87/88	88/89
Software Licences	\$0.3m	\$1.05	\$1.25
Maintenance Services	\$0.2	\$0.9	\$1.2
Increments to Facilities	\$0.4	\$0.6	

REPATRIATION HOSPITALS - COMPUTING FACILITIES
NEW POLICY PROPOSAL - AUGUST 1985

Hardware Costs increased by 10% to take account of
Exchange Rate movements since Dec 1984
Ongoing Software & Maintenance Costs included

	1985/86 \$m	1986/87 \$m	1987/88 \$m	1988/89 \$m
RGH Concord				
Hardware *	1.9			
Site Prepn. *	.4			
Software and Maintenance	.3	.6	.6	.6
RGH Heidelberg				
Hardware		1.76		
Site Prepn.		.3		
Software and Maintenance		.5	.425	.425
RGH Greenslopes				
Hardware		1.32		
Site Prepn.		.3		
Software and Maintenance		.2	.425	.425
RGH Hollywood				
Hardware			1.32	
Site Prepn.			.2	
Software and Maintenance			.2	.285
RGH Daw Park				
Hardware				1.21
Site Prepn.				.2
Software and Maintenance				.2
RGH Hobart				.22
<u>Totals:</u>	<u>\$2.6m</u>	<u>\$4.98m</u>	<u>\$4.78m</u>	<u>\$2.24m</u>
<u>4 yr Total:</u>	<u>\$14.6m. **</u>			

* Hardware and Site Preparation allocations each increased by \$100,000.

** Figure used in DVA's Budget Highlights 1985 press release,
page 19.

APPENDIX 2

Table 2.3

REPATRIATION HOSPITALS - COMPUTING FACILITIES
COMPARISON OF COST ESTIMATES

PCS PROJECT COST

ITEM	NPP ESTIMATES		DISC CONSULTANTS	
	JULY 1985	PCS PROJECT COST ESTIMATES	JULY 1985	PCS PROJECT COST ESTIMATES
Hardware Acquisition	3 yrs: \$5/86-87/88 ⁽¹⁾	\$m	3 yrs: 85/86-87/88 ⁽²⁾	\$m
Computer Site Prep.	7.9		7.3	
Software Licences &	1.3		1.2	
Maintenance:				\$8.25
- initial/part year:				1.275
- full year costs	1.4		1.235	
NCC Support Staff	2.45		1.525	
PCS Team Costs	0.45		0.2	
RGH Operations &	(4)		0.94	
Implementation Staff	0.350 ⁽⁴⁾		1.35	
		\$13.85		2.85
		\$13.75		
				\$20.475
				230

Notes:

- (1) NPP 2204 Includes expenditure to be met from appropriations - Table 2.1 Note 3 refers
- (2) Appendix D - DISC Report
- (3) Appendix D - DISC Report - Used by DISC in 5 year PCS Cost Benefit analysis
- (4) PCS activity costs were not developed for NPP.

APPENDIX 2
TABLE 2.4REPATRIATION HOSPITALS - COMPUTING FACILITIES
RGH CONCORD - PROPOSED CONFIGURATION COST ESTIMATES

	1985/86	List Price
<u>Processor</u>		
1 x 4381 - P02 Group 2, 16 Mb Main Memory		\$ 936,000
<u>Disk Sub System (10 gigabytes)</u>		
2 x 3880 - 3 Control Units		
2 x 3380 - AD4 Drives		
2 x 3380 - BD4 Drives		\$ 644,000
<u>Magnetic Tape Sub System</u>		
1 x 3480 - A22 Control Unit		
1 x 3480 - B22 Mag Tape Unit (2 drives)		\$ 155,000
<u>Communications Front End Processor</u>		
1 x 3725 - 2 Controller		\$ 133,000
<u>Line Printer</u>		
1 x 4245 - 012 Line Printer		\$ 52,000
<u>Terminal Sub System</u>		
4 x 3274 - A41 Control Unit		
15 x 3179 Colour Display Units		
5 x 3287 - 2 Printers		\$ 140,000
IBM Sub Total		\$2,040,000
Less discount (min.)		\$ 204,000
Terminal Installation costs (est.)		\$ 1,836,000
		\$ 30,000
TOTAL		\$1,866,000

Additional IBM 3179 compatible terminals and IBM 3287 compatible printers will be acquired using the Panel Contract with Telex Computer Products.

PATIENT CARE SYSTEM PROPOSAL

PATIENT CARE SYSTEM PROPOSAL

BACKGROUND

The Department has progressively established, over the past twenty years, a comprehensive corporate client data base (CDB) relating to its clients. Details have been accumulated of:

- Personal particulars
- Eligibility
- Claims
- Pension Benefits
- Treatment
- Personal Case files

IBM-compatible hardware and IBM software, particularly the IMS data base management system, are used.

Repatriation General Hospitals use a DVA-developed system for Admissions, Discharges and Transfers (ADT) which accesses and transfers basic information from the CDB to the Patient Status File Data Base (PSF). Inpatient details are retained on the PSF for 28-56 days after discharge. The information is then removed from the file and archived. The hospitals also directly interrogate the CDB for information on personal particulars, eligibility, disabilities, entitlement and pension claim details, pension payment details and file location information.

Branch (State) Offices access all elements of the CDB in processing claims, paying benefits or assessing entitlements. To assist in performing these functions they also need to have access to hospital treatment information.

Extensive systems resources (amounting to over 65 staff years or \$3m in current terms) were applied to the development of the ADT system for the RGHs over the period 1970-76. Hospital systems have not been accorded a high priority since that time due to the need to support the expanding DVA systems associated with benefits and treatment:

- in the absence of staff resources, the Department has solved several pressing processing problems in RGHs through stand alone "turn-key" computer systems e.g. PRIME/Wards for Stores Inventory and WEBSTER/Nicholson for Biochemistry in the three eastern State RGHs;
- these systems (costing \$3m) represent the outcome of open tendering arrangements and are largely incompatible with the central IBM-compatible computer;

the demand for other systems solutions in the RGHs is great:

- haematology, pharmacy, outpatient appointment scheduling, X-ray record keeping, community health service management and medical record abstracting are all currently proposed for computer solution by different RGHs;
- in the absence of an integrated hospital information system, each is likely to result in a discrete "turn-key" solution of hardware and software.

While the Department manages a central CDB, it is estimated that some forty discrete, unco-ordinated data bases containing patient information are held in each RGH. While PCs/microcomputers have been a boon to professional and administrative staff, they have led to uncontrolled growth in separate patient data bases.

This fragmentation of patient information is having a considerable impact on the quality of patient care provided in the RGHs, contributing to:

- excessive processing time in the admission and discharge of patients;
- excessive length of stay in hospital due to poor communication of patient service requirements (orders for laboratory tests, radiology, pharmacy etc.);
- inefficient scheduling of patients, clinics and transport services;
- discomfort in repeated laboratory testing and meal mis-direction.

Improvement in clerical processes, particularly in ADT and Outpatient Scheduling and intra-hospital communication of orders, tests and results is predicated on a central patient data base and interactive enquiry facilities.

For five years DVA has been reviewing systems options that would enable:

- Branches and RGHs to share access to an expanded data base of client information for improved communication and to reduce data entry workload and data inaccuracies;

- users to develop systems without heavy reliance on scarce systems staff resources;
- RGHs to develop different systems to meet different management needs and hospital characteristics;
- access to the wealth of existing systems developed world-wide by hospitals and available for local installation;
- its investment in IBM-compatible central systems and data bases to be secured. (A consultant from SRI USA in 1985 estimated that a move by DVA from its IBM IMS environment to another data base language would involve over 25 staff years of effort).

The only tool that has been located in the course of extensive investigation, including two overseas fact-finding visits, that will assist the Department to integrate its information systems on IBM-compatible facilities, is the IBM PCS/ADS software.

PCS/ADS

Patient Care System/Application Development System (PCS/ADS) is a form of fourth generation language - a software product marketed by IBM.

PCS/ADS is a framework for hospital information systems development on an integrated basis. Staff resources from user areas can achieve rapid systems implementation.

PCS/ADS is the systems development technique used in over 250 large hospitals overseas. (Loma Linda Hospital, California, estimates PCS/ADS systems development is achieved in one-third the time taken for COBOL-based systems).

Hospital applications have been developed in PCS/ADS by many organisations for their own needs and/or for commercial reasons. Computer applications are offered by:

- Individual hospitals:
 - systems may be marketed directly, through licensed third parties or made available without support through the users' group;
- Third Parties, especially Baxter-Travenol, Compucare and Price Waterhouse:
 - there is no marketing or support in Australia at this time from such organisations;

IBM, which has acquired the rights to a number of applications and is promoting the development of others, particularly to meet local requirements.

In possibly the most computerised hospital in the world (Stony Brook N.Y.) over 100 PCS computer applications have been installed in six years with only six programming staff. The hospital claims cost avoidance of over \$15m in five years through its PCS systems.

IBM HARDWARE AND SUPPORT

IBM Australia reports that all 250 hospitals using PCS operate IBM computers (National Advanced systems claim that two users of PCS have NAS computers installed). The PCS Users' Group is restricted to users of IBM hardware.

While the PCS/ADS software is marketed by IBM and maintained in accord with standard software licensing arrangements, substantial software support is required from IBM in:

- PCS/ADS user staff training;
- CICS/DL/1 and IMS technical training;
- integration of PCS/ADS into the computer operating environment;
- PCS data base use.

The foundation module of an integrated hospital information system is the PCS Patient Master Index data base (PMI). IBM Australia is tailoring that data base to Australian hospital requirements and incorporating the In-patient Management application.

DVA must acquire the IBM-developed PMI/Inpatient Management system (PMI/IM) or:

- develop an equivalent system in-house:
 - DVA attempted this task in 1984/85, unsuccessfully;
- arrange with an overseas Third Party to undertake an alternative development to meet Australian requirements:
 - such a development is unlikely to be cost effective or timely.

Applications Support is required of IBM in respect of PMI/IM and subsequent applications requirements, embracing:

- Systems planning;
- PMI/IM modification, enhancement and implementation assistance;
- Joint development of uniquely Australian or RGH applications, including Outpatient Appointment Scheduling;
- Installation support of IBM marketed applications;
- Technical assistance in the design and development of uniquely RGH technical requirements, e.g linkage of IMS and DL/I data bases, communication networks;
- Links to the overseas hospital users of PCS and access to their PCS products.

The above Software and Applications Support is expected from IBM at little or no charge to IBM users through its Marketing Services.

If computing equipment is not acquired from IBM - for the PCS development at RGH Concord - additional DVA PCS Project resources will be required, to substitute in part for the lack of this IBM support. It is estimated that the PCS team would need additional resources of:

- six additional systems staff;
- four staff years of systems engineering support during 1986-88;
- \$300,000 p.a. for overseas consultants and overseas assignment of DVA staff.

A delay of six months in PCS installation is expected.

ALTERNATIVES TO PCS/ADS

PCS/ADS provides the only opportunity for the RGHs to begin to install a patient-based, integrated information system.

If PCS does not proceed, it will be necessary to acquire a further range of discrete computing systems for each RGH, as funds become available, to address urgent processing demands throughout the patient care and patient service functions.

While several integrated hospital information systems are marketed in Australia, (based on DEC, Burroughs, AWA or PRIME computers) they are technically incompatible with the Department's IBM, software orientation of its corporate, client data base.

For a user of IBM-compatible facilities, PCS/ADS is the only suitable framework for systems implementation. Successful implementation requires extensive support from IBM. IBM offers such support only to users of IBM facilities.

COMPUTER TERMINAL TRANSACTIONS - ANALYSIS

APPENDIX 4

PAGE 1 OF 2

Analysis of RGH Concord ADP Systems Usage - September 1985 (See
Public Accounts Committee file for this data).

APPENDIX 4

PAGE 2 OF 2

See Public Accounts Committee file for this data.

SPECTRUM OF HOSPITAL INFORMATION

SYSTEM REQUIREMENTS

CONTENTS

- 5.1 Schedule of PCS Applications in Development or Production cycles derived from selected Hospital, Government and Industry publications.
- 5.2 Information Systems Implementation plan for Department of Health - New Zealand.
- 5.3 Information Systems plan for Royal Adelaide Hospital.
- 5.4 Information Systems plan for Department of Health, N.S.W. Computer Division.
- 5.5 Major PCS Applications at New York State University Hospital, Stoney Brook as of 1985.

PCS APPLICATIONS IN DEVELOPMENT OR PRODUCTION CYCLES

More than 200 hospitals worldwide are running PCS based applications. Below is a listing indicating the type and range of applications that have been developed by I.B.M., third party vendors, hospitals or other health care organizations.

This list is not exhaustive, for it depends on the user's interpretation in the naming and use of applications.

Inpatient

patient indexing
previous patient data
bed reservations
pre-admit/admissions, transfers and separations
census
room and bed statistics
lists and reports
patient dependency
ward/bed control
morbidity analysis
on-line enquiry
emergency services
disaster

Outpatient

appointment scheduling
output/ER register
previous history
multiple visits
output/ER statistics
charge collection
on-line enquiry
pre-admission testing

Nursing Services

order entry
result retrieval
nursing care plans
charting
patient scheduling
nurse care scheduling
nurse staffing
patient activity
message sorting
reference data system
nurse budgeting

Pharmacy

order entry input
order entry output
orders entered for N/S
medication profile
drug to drug interactions
drug to lab interaction
drug to food interaction
label printing
filling/dispensing reports
medication schedules
IV admixture
inventory control
drug formulary
charting
dose calculation

Radiology

order entry from N/S
order entry from Department
resources scheduling
film tracking
result reporting
worklists
patient logging
flash card printing
RVU statistics
film history

Laboratory

order entry from N/S
order entry from Departments
worklists
collection lists
result reporting
instrument interfaces
lab management
norm value/dept checking
anatomical pathology
biochemistry
haematology
microbiology
blood bank

Surgery

OR scheduling
statistics
Op reports
case review

Dietary
order entry
nutritional analysis
recipes
menu selection
menu planning
inventory

Medical

medical records index
chart locator
abstracting
incomplete charts
utilisation review
microfilm management
index reports(disease/operation)
management queries
tumor registry
medical library circulation system
DRG's
case mix management

Central Supply

order entry
floor stock inventory
inventory control
cost centre tracking

Other

physical therapy
respiratory therapy
occupational therapy
EKG
ECG
EEG
infection data management
sterile services
social work
sleep disturbance
renal dialysis
neo natal treatment
patient cost analysis
community care
patient referral

Non Patient Database Applications

patient billing
accounts receivable
general ledger
payroll
personnel

materials management
fixed assets
purchasing
manpower budgeting
sundry debtors ledger
rostering
preventative plant maintenance
capital asset accounting
fund raising
cashiering
physician billing
demand bills
employee master index, employee profiles
financial modelling
departmental reporting
enhanced security
doctor sign in
doctor master file
training programs under PCS
transportation
electronic calendars, diaries
information desk
switch board

SCHEDULE FOR IMPLEMENTING THE HEALTH COMPUTING STRATEGIC PLAN
FOR THE DEPARTMENT OF HEALTH - NEW ZEALAND

APPLICATION	IMPLEMENTATION PER APPLICATION(as a %) COMPLETED PER YEAR				
	1985/86	1986/87	1987/88	1988/89	1989/90
NPS	100				
FSMS	100				
NMPI	100				
PMS/ADT	20	30	25	25	
Outpatients	5	28	33	33	
Laboratory	20	30	15	15	20
Radiology	12	13	25	25	25
Pharmacy	25	40	15	10	10
Dietary	10	20	30	40	
Nursing	20	40	40		
Appointment Scheduling	5	20	25	25	25
Medical Records	5	20	25	25	25
Blood Transfusion	50	50			
Community Care	5	20	25	25	25
NHSC	30	30	10	10	10
Information Systems	50	50			
Office Systems	10	10	10	10	10
National Registers	10	10	40	40	
DOH Applications	10	20	20	50	

KEY:

NPS - Nationwide Payroll System

NMPI - National Master Patient Index

NHSC - National Health Statistics Centre systems

FSMS - Financial and Stores Management systems

Extracted from the HEALTH COMPUTING STRATEGIC PLAN Department of Health
New Zealand January 27th 1986.

IMPLEMENTATION PLAN FOR THE ROYAL ADELAIDE HOSPITAL
FOR THE NEXT THREE YEARS.

APPLICATION	YEAR		
	1	2	3
EMI	—		
O/E Supply	—		
Inventory	—		
O/E Patient		—	
O/E People		—	
Manpower Budget		—	
O/E Services		—	
Statistic Reporting	—		
Roster/Allocation		—	
Clinical Summary		—	
Facilities Mgt		—	
Manpower Plan			—

KEY:

EMI = Employee Master Index

O/E = Order Entry

Only the targets illustrated above can be achieved in the three years.

Development of a personnel system for all employees which can interface with financial and patient systems, and development of facilities in each ward for on-line ordering of patient services will be progressively developed.

It is expected to be at least five years before this complex system is developed.

Taken from a paper HOSPITAL INFORMATION SYSTEM SIZING by IBM Australia Ltd.

IMPLEMENTATION PLAN OF MAJOR SOFTWARE APPLICATIONS
FOR DEPARTMENT OF HEALTH, N.S.W. COMPUTER DIVISION as at 1.11.85.

HOSPITAL	APPLICATION							
	PMI	BIO	HAEM	DI	ATS	HOSFIN	HOSBIL	
Armidale	I					O -		
Blacktown	O					O -		
Canterbury	O					O -		
Gosford	O					O O		
Hornsby	I					O I		
Lewisham	O					P -		
Lismore Base	O					O -		
Lismore (St Vincents)	O					I -		
Liverpool	P	O	T	I	I	O -		
Macarthur Area H.S	I					O -		
Macquarie	O					E -		
Mater Newcastle	I					E E		
Newcastle	O					O O		
Oral Newcastle	O	O		O	P	O E		
Orange	O			O	P	O P		
PCW/Prince Henry	O	O*		O	P	E E		
RAHC	O	O		O	P	E E		
RNSH	O	O		O	P	E E		
Royal South Sydney	I					O -		
St George	O	O				O -		
St Margarets	I	O				E I		
St Vincents	O	O				O -		
Sydney	O	O		O	P	O -		
Wagga Base	O	I		O	P	I I		
Wallsend	I			O	P	O O		
Western Suburbs	E			O	P	E -		
Westmead	O*					I I		
West Met Region	O	O	I	P		O -		
Wollongong (IAHS)	O	O		I	P	E -		
Young						O -		
Young Mercy						I		

J.V.

O = Fully operational

P = Operating on live data in parallel with existing system

I = Currently implementing i.e. staff are being trained and data bases/files being loaded with live data.

E = Production version installed for hospital evaluation

T = Development version undergoing final test before release to operational sites

* = Indicates the modified PALIS Biochemistry system

HOSFIN = Financial package, F indicating Financial module and S indicating Stores module

PMI = Patient Master Index

BIO = Biochemistry system

HAEM = Haematology system

DI = Disease Index system

ATS = Admissions, Transfers and Separations system

HOSBIL = Patient Billing system

Extracted from DEPARTMENT OF Health N.S.W. Computer Division Newsletter November 1985.

MAJOR PCB APPLICATIONS AT NEW YORK STATE UNIVERSITY HOSPITAL, STONY BROOK - 1985

UNIVERSITY PCP/PA

HEALTH SCIENCE CENTER

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

EMERGENCY ROOM INFORMATION SYSTEM

SYSTEM RESPONSE

ADMISSIONS, DISCHARGE, HOSPITAL	ACUTE CARE SUPPORT	FINANCIAL SUPPORT	ADMINISTRATIVE SUPPORT	EDUCATIONAL SUPPORT	OPERATIONAL SUPPORT
DATA MANAGEMENT					
- LABORATORY DATA					
- ADMISSIONS					
- PATIENT RECORDS					
DATA PROCESSING					
- PAYMENT SYSTEM					
- PAYMENT PROCESSING					
DATA BASES					
- PATIENT RECORDS					
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STUDY OF SELECTED HOSPITALS AND HEALTH CARE ORGANISATIONS

USING P C S BASED APPLICATIONS

IN THE UNITED STATES AND CANADA - OCTOBER 1985

BY OFFICERS OF THE WESTERN AUSTRALIAN DEPARTMENT OF HEALTH

HOSPITALS VISITED :

- 6.1 GOOD SAMARITAN HOSPITAL, WEST PALM BEACH, FLORIDA
- 6.2 STONY BROOK HOSPITAL (STATE UNIVERSITY OF NEW YORK)
- 6.3 BROOKLYN METHODIST HOSPITAL, NEW YORK
- 6.4 SUNNYBROOK MEDICAL CENTRE, TORONTO, CANADA
- 6.5 EVANGELICAL HEALTH SERVICES, CHICAGO, ILLINOIS
- 6.6 LUTHERAN GENERAL HOSPITAL, CHICAGO, ILLINOIS
- 6.7 STANFORD UNIVERSITY MEDICAL CENTRE, PALO ALTO, CA.
- 6.8 LOMA LINDA UNIVERSITY MEDICAL CENTRE, SAN BERNARDINO, CA.
- 6.9 PACIFIC HEALTH RESOURCES, LOS ANGELES, CALIFORNIA
- 6.10 MARTIN LUTHER HOSPITAL, ANAHEIM, CALIFORNIA

Notes prepared and permission to reproduce given by

Ms Barbara Proud, Director, Information Management
Health Department of Western AustraliaGOOD SAMARITAN HOSPITAL - FLORIDA3 OCTOBER 1985

Lillian Capote: Director of Management Information Systems

326 bed (non teaching) hospital

Equipment

2 and a half years ago the hospital switched from Burroughs to IBM equipment.

- 12 mb memory IBM 3080
- 130 terminals and printers (99% of these are in the wards)
- IBM PC's have 3279 (terminal) emulation boards. Authorised users can download files from this mainframe.
- A backup machine (dual mainframe) is not considered necessary. IBM hardware is very reliable. There is more "processing value" for the dollar if expenditure is directed toward a single mainframe. A reliable power supply was seen to be of great importance.

PCS/ADS

- ATS and Order Communications systems went live in February 1984. This is the standard IBM PMS system.
- PCS/ADS makes it very easy to build systems - so much so that you must be careful not to run out of hardware capacity. Because of this, an Advisory Committee reviews applications for modifications and new systems.
- IBM will soon release an updated PCS version (PMOC) with an improved database structure - this is to be implemented. This new version includes a Nursing Care Plan system.
- There is an interface to the laboratory system (Meditek system on DEC equipment).
- The next development phase is result reporting.
- There are 800 screens in the system, most of which have been tailored (by a PCS trained user) to suit the user requirements.
- Medical records chart tracking and Nurse staffing/activity (used for historical information and budgeting, not scheduling) have been developed in-house using PCS/ADS.

DP Staff

- There are 3 programmers (one of whom maintains a few small "old" systems migrated from Burroughs).
- The comment was made that 2 programmers and a good typist (for documentation and input of the screen designs) should be sufficient for a system of this size.
- The programmer learning curve for PCS/ADS was 6 to 8 weeks.
- Programmers were not receptive to PCS or the "style" of the PCS approach and had to be "forced" off Cobol.

Users

- Initial reaction was "too many screens to page through" (as compared to the earlier, smaller, Burroughs system). As users became familiar with the system and realised the vast increase in function and potential, they readily accepted the menu screen approach.
- Users find the system easy to use and have a very positive attitude towards it.
- Thorough training was given to all users on all aspects of the system (as opposed to a "need to know" basis). This was to give the users confidence with the system overall and to allow for ease of transfer of staff duties/roles.
- Training is very important and requires organisation and commitment.

Critical Success Factors

- Senior Management Commitment
- Implement the standard PCS/ADS/PMS products (known as "vanilla" versions)
- Good project management
- User training
- User involvement

Other Items

- There is no Information Centre Facility, but it has been considered - PCS development has a higher priority.
- Financial systems are run using an outside bureau service.
- There is no data dictionary in use - standard system library facilities are sufficient.
- There is no security package in use - sufficient security being offered by PCS and the system Communications (CICS) software.

51105DC1/ICF1

7 November 1985

Long Island, New York.

SBH serves a catchment area of 1.4 million people. It has 540 beds, 100 of which are ICU because SBH is a tertiary care referral centre.

It is estimated that over 5 years the Hospital Information System has saved the SBH \$10.7 million (costs avoided).

When the implementation was done it was in a new facility and had to be done in 6 months. The design of the building did not help - it is not conducive to good communications. It is also labour intensive (only single or double rooms).

In 1984 12,000 Admissions.
45,000 Emergencies
135,000 Ambulatory care.

It was decided to buy a package to achieve a fast implementation. It was decided to have a fully integrated system with a standard data base structure.

An RFP was prepared with 365 mandatory requirements only one of which referred to hardware (and this was that it must be capable of being light pen driven).

PCS was chosen because of

- cost
- ease of installation
- not dependent on a large DP staff
- fully integrated
- at the beginning of its product life cycle
- vendor support/commitment
- human engineering/user perspective (light pen/data driven).

SBH has had 6 programmers for 5½ years. They now have 7.4.

In July 1979 began training, October the hardware was delivered and in February 1980 PCS was operational with ADT, O/E, Results reporting, Medical Records in place. 1800 screens were designed, 300 data base programmes. 600 staff were trained.

SBH are about to bring patient accounting in-house (have been using an outside interface).

The laboratories were using a Series 1 minicomputer but will now use PC's as the interface between equipment and the mainframe (This is being done in New Zealand).

PCS/ADS has been used to develop a total inventory system (purchasing, receiving, budget generation),

- 2 -

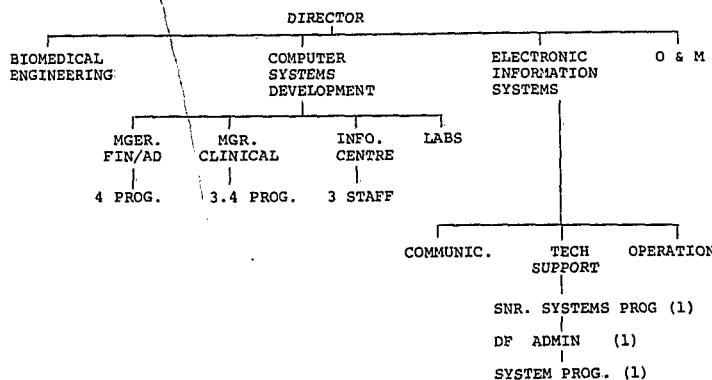
Other modules include Accounts Payable, Financial modelling, G/L (an interfaced package), laboratory quality control and a medical equipment management system (being developed on PC's).

The Radiology system allows for physicians to dictate the results which are then entered into the system (can take up to 24 hours).

Haematology - uses an ASTRA-8 - all results are reviewed by a technician and can be available in 2 hours (STAT).

Dietary and CSSD are also on-line real time systems.

The system runs 24 hours/7 days. The hospital has 2,490 staff, 70.4 of which are in the information services division.



The DP budget is \$1.9 million (including staff). There are 300 terminals and 100 printers. In January the mainframe will be a 3083EX which will be upgraded to a BX in June.

The software used includes

MVS	DLL
JES2	TSO (not used anymore)
CICS	SMS Financial System
Easytrieve	

The system has 98-99% reliability. It has been down for 14 hours in 1985.

.../3

There have been 105 developments since initial installation.

A survey of users is conducted every 6 months. Acceptability of the system has risen from 28% to over 80%.

One of the reasons for its success has been the commitment of senior executives. The Information Centre has been an important part of the system - it is used as the main user interface.

The User Co-Ordinator Network

Departmental supervisors

- trained in the use of screen coding and report generation.
- can do minor modifications of screens (format and flow) and ad hoc reports.
- do this in the development system and it is then approved by the IS division to go into production.

Users believe that it is their system

- user support
- no surprises
- greater acceptability
- reduction of backlogs
- team participation
- new skills for co-ordinators

Training is very important - must have a properly organised on-going programme.

Nursing trains their own staff and user co-ordinators train their staff. The Information Centre trains groups of new residents and so on.

The responsibilities of top management are

- to set hospital goals and priorities
- understand the complete implementation
- provide the budget

It is vital to have a strategic, long range plan for the hospital.

A joint development is being undertaken with Siemens to produce a bedside patient management system - monitors by the bed will transmit vital signs and receive lab results.

Nurses still spend up to 2 hours per shift on clerical work. SBH is trying to replace all hand written flow sheets or work sheets. Print-outs can be produced for the mandatory hard copy medical record.

PCS has provided significant productivity improvements and can be cost justified.

DRG's will go in January - will change the medical record system.

As SBH has hundreds of visitors each year decided to market its system through Price Waterhouse.

SBH has no data entry clerks.

Full tapes of cases/diagnoses are sent to the NY State Health Commission.

SBH has an agreement with IBM to respond to the NZ Health Department tender.

Negotiations are proceeding with 6 hospitals for the complete system and another 2 want the inventory system.

At the moment considering the use of bar-coding for physical inventory, medical records, x-rays tracking.

Is the 3083 adequate? At the moment it has much more power than needed. 3-5 years growth is possible. It is running at less than 40% utilization and response time is 1-1½ seconds.

There is no back-up machine. Daily back-up tapes are taken.

The major problem is power. It is important to have adequate power backup.

Down-time procedures are stored in the buffer of terminals so can always be accessed.

Manual back-up procedures are slow but adequate.

PC's are presently being installed in the laboratories.

10 computer operators cover 3 shifts.

Why isn't this system shared with other hospitals?

- infringement on their "turf".
- would have been more cost effective to do so.

NY State wants uniformity of systems so that developments can be shared between institutions.

Price Waterhouse NY - Howard Johnson

The NY office concentrates on EDP installations.

PW has a case-mix system for DRG's installed at Rush Presbyterian Hospital in Chicago (joint development). Now marketed to another 60 hospitals.

Some of the standard programmes have been sent to Mike Rosser.

In the USA PW has 150 health care consultants.

The suggested implementation team is:

Client
SBH
PW (uses the Systems Management Methodology for large systems)

There is a big difference between the traditional application and the prototype approach.

The implementation plan:

- demonstration (SBH)
- planning and proposal
- technical analysis (software/hardware)
- load SBH system
- make cosmetic changes (screens)
- prototyping
- modify prototype

"User is in Charge".

PS USA would send people to assess our needs. The number sent would depend on the number of our own staff available to assist.

500 days of PW time would be typical. This would also assume 500 days of user time and 500 days of client's DP staff time.

PW has done some analysis of DB2 vs IMS. There is little experience with DB2 in the USA yet. At the moment DB2 can handle about 10-15 transactions per second. A new release of DB2 in December should improve this to 15-20 transactions per second

SBH has no personnel system in the hospital. A position control system is controlled in the Health Sciences Centre.

There is no nurse rostering - doesn't appear to be required as nurses tend to always work in the same area - they are not scheduled on acuity or patient load.

It is planned to use MSA package for personnel.

MSA also has a cost accounting/case mix package.

Conclusions

There are no easy solutions.

Advise that

- executive commitment is essential
- consultants should be used selectively and wisely
- it is important to invest in a comprehensive plan
- user commitment and involvement must be secured

BROOKLYN METHODIST HOSPITAL, NEW YORK, OCTOBER 8, 1985

\$14 beds
Mainframes 4381/4341
120 - 130 terminals (250-300 in 2 years) all light pen
50-60 printers

Brooklyn Methodist Hospitals commenced using PCS 3 years ago.
14 people from Travenol are employed to implement the systems.

A totally integrated laboratory system is being developed using
a Series 1 between lab equipment and the mainframe.

No PC's are used.

The effect of DRG's has been to reduce the U.S.A. hospital
census by 10-20%. Many hospitals are closing wards. Much
more emphasis on home care and out patients.

It is important that comprehensive information systems can cope
with continuity of care from the hospital out into home care.

Quality control is assisted by setting parameters for diagnosis/
pharmacy/nursing care/home care/lab tests etc.

Nursing Resources Management is under development and will be
complete in 2 months. (Rostering, skills inventory, personnel,
leave etc.).

Material management system at Methodist will also be installed
at Sutter and Sunnybrook.

Medical Records System very impressive.

Critical Success Factors

1. Sound business plan.
Why are we installing this equipment?
2. Transfer of expertise.
3. Applications portfolio/prototyping
4. Skills transfer
 - Project management - hospital knowledge
 - Development of user co-ordinators.
 - local support
 - send own people to sites to learn.
(difficult to learn from a package)
 - Users change to suit systems - but with some enhancements
 - Infrastructure (communications).
5. Capacity planning.
6. Performance evaluation.

SUNNYBROOK MEDICAL CENTRE, TORONTO, ONTARIO, CANADA, OCTOBER 9 1985

PRESENT: Peter Ellis - Administrator
Carolyn Sayman - Information Services
Paul Sulker - Travenol Manager
IBM representatives

Sunnybrook Medical Centre (SMC) was formerly a Department of
Veterans Affairs hospital. It is now the University of Toronto
Teaching Hospital. It is the regional centre for trauma patients
and has a large number of veterans and rehabilitation patients.

There are 1,020 Acute/Extended Care beds
14,000 Inpatients pa
220,000 Outpatients pa
37,000 Emergency patients pa

Doctors are employed full-time at the SMC and have their offices
on-site. There is also a Cancer Centre.

Financial systems are presently running on Burroughs equipment
but will be replaced.

Travenol have been contracted to install their whole product line.

SMC has a 4381 Model 3 mainframe with 3380/3880 for data storage
and uses MVS/XA and CICS/IMS.

The network uses 3178/3278 light-pen VDU's, 4201 pro-printers
and will use IBM cabling or Bell Canada PBX.

Peter Ellis described the SMC environment. The new president of
SMC (Dr Martin Barkin) was pushing towards their goals very
quickly.

He described their strategy in the following way.

<u>PAST</u>	<u>PRESENT</u>
How Departmental	vs Corporate
Doing things right	vs Doing the right thing
Business Case	vs Strategic Case

In 1982 SMC had a \$13m deficit. The Ministry of Health reviewed
the organisation and appointed a new president who brought with
him a new philosophy. He has defined the "mission of Sunnybrook"
in terms of what business it should be involved in. He has
increased the Information Systems budget from 1% to 2-3% by re-
allocation of resources within SMC. He was no longer prepared
to allow departments to make their own system decisions. He
wanted to find an integrated system to allow for proper information
sharing but which could also meet individual requirements.

The system had to be "patient-specific", but also had to integrate with financial systems.

Travenol have been contracted to provide an integrated Hospital information system and will also either integrate present financial systems or introduce new IBM software. The latter is thought to be most likely.

The functionality of each department of the hospital was described.

ASP is used for prototyping - it helps users to accept the system. They are not delivering a final product out of the users control. It was very important to have a flexible system.

SMC and Travenol see themselves as being involved in a joint venture.

Paul Sulkers spoke about the implementation of PCS at SMC.

Project Objectives were established. PCS/ADS is the strategic systems Architecture and no unauthorized stand-alone systems are permitted.

Implementation is by process not by department.

It is not an all or nothing system. The changes can be ongoing.

Carolyn Sayman spoke about the critical success factors of the project.

1. Resourcing
2. Skills transfer
3. Orderly refinement of specs.
4. Project management
5. Executive support
6. Initial image of success
7. System service level
8. Network archiective
9. Definition of cost-accounting module
10. No unauthorized stand alone systems

Travenol is responsible for

- implementation plan
- application software (customized/tested/training/maintenance/documentation)
- hardware
- network
- system software

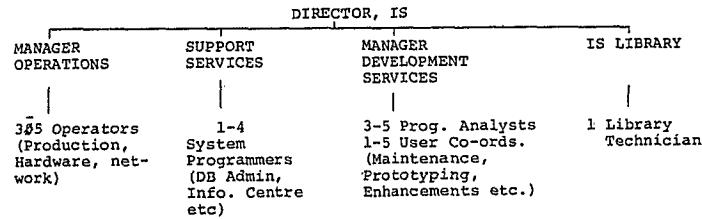
IBM is responsible for

- hardware
- network
- system software
- application software (PCS)
- planning assistance
- education services

SMC is responsible for

- funding and budgeting
- training of users
- application software
- co-ordination of implementation
- appropriate staffing and training
- hardware
- network
- system software
- hospital project structure
- operations
- longer term planning and priorities
- physical security
- disaster plans

Information Services, SMC



For the 600 acute beds there are 200 terminals/75 printers provided centrally. User departments have to fund additional items if required.

Travenol will provide 4 FTE's for this project.

10.10.85 EVANGELICAL HEALTH SYSTEMS

CHICAGO

PRESENT: Betty Hudson
VP Systems EHS
Dick?
IBM

Background

From 1980 EHS has progressed from owning a single 900 bed hospital to being a multi-hospital organisation. Since 1981 it has become part of a multi-corporation conglomerate. The not-for-profit and for-profit companies are separate and the latter subsidize the former.

The thrust has been into nursing homes, home health care etc. EHS manages 4 retirement centres, surgery center and a medical hi-tech centre.

The business diversification occurred as a response to DRG's.

The hospitals are not-for-profit (church mission) and run at losses. Bethany Hospital was recently rebuilt at a cost of \$20 million. The emphasis is on cost-containment.

Information Systems

Basic batch financial systems from McAuto existed in 1980. Consultants (Ernst & Whinney) recommended the purchase of software packages and a patient care system. IBM's PCS was selected (better price and flexible).

McCormack and Dodge have provided financial systems (Accts payable, GL, purchasing, MSA Payroll). It took 18 months to install the above and also PCS's admitting and order/entry. In 1985 have pharmacy, radiology, record tracking, etc. An inventory system has been developed in CICS (in-house).

Apart from 6 months initial help from Ernst & Whinney no full-time contracted support has been used. E & W are still used for short-term specific projects.

IBM support has been significant (essential for success) IBM has provided 2 on-site systems engineers, and help with planning. Health Industry support-in the form of people with hi level expertise in PCS is absolutely essential.

At a former hospital an internship arrangement with IBM operated. IBM sent people to work on projects in order to gain expertise in PCS. The hospital benefited from the IBM technical expertise.

A certain inventory of skills is required for a successful PCS installation.

Skills in the following are essential: DL/1, CICS, IMS/MVS, assembler language (to maintain ADS and tables - 4 FTE).

Systems must be kept up-to-date as IBM upgrades its software and you must be able to take advantage of new releases.

Integrated installation teams are used (50% non-programmers at EHS - nurses, pharmacists etc). The non-programmers have intensive communication with users and define the user requirements - programme specs - user support. They also test, train etc.

EHS tries to develop all new systems in PCS/ADS. Some batch applications are in COBOL etc but trying to find a 4GL and a report generator (eg. Easytrieve) to avoid any coding.

They have developed in PCS/ADS - cost accounting, nursing acuity system, patient cost analysis, case mix system, medical information collection (from medical records).

System W (Comshare) has been selected as the 4GL (before DB2 was announced).

Most on-line development can be done with PCS/ADS except where you need forecasting etc.

Present systems are 1/3 financial 1/3 PCS 1/3 management support in nature.

Most of the staff are in H.O. 15 people provide customer support. Expect to increase this number and decrease the number of programmers. 20 people in operations - machine room mgt/help desk/batch scheduling.

In the hospitals usually 1 data systems manager and 1 or more support staff. There are also HIICS (Hospital Info. Install. Co-ords) - these people occupy senior admin posts and liaise with H.O. They help to organise training, priorities, performance evaluation, QC - takes up to 20% of their time.

There is a steering committee at corporate level.

* "Multi-hospital support" software is available from IBM. It is a feature of ADS. Each hospital has a separate DB but don't need 5 different sets of programmes. The multiple DB's makes downtime less for each hospital.

You can have different screens etc with same DB. Hard coded material is common to each hospital. This saves on machine and people resources. Duplication only occurs where differences can be proven.

EHS sells its software but does not provide support. Recently installed software and had a test system up in 2 days at Albert Einstein Hospital..

Data communication is by telephone leased lines (9,600 baud) 10 lines go to largest hospital. Controllers are in each hospital.

There is no mainframe backup. The most common causes of failure are not the mainframes or controllers. Problems are usually in the network, software etc.

EHS have decided that the cost of mainframe backup is not warranted.

* (Arrangement with DOCIT to access machine in disaster?)

No additional security software is used as PCS's security is thought to be adequate (no dial-up).

EHS don't use a data dictionary (gave up). PCS has a data manager facility.

* The University of Iowa has a PCS/ADS Directory Generator which generates a PCS data manager directory if you have a well integrated product.

Light pens are used except in pharmacy.

No labs systems developed.

LUTHERAN GENERAL HOSPITAL, CHICAGO

OCTOBER 11, 1985

In 1979 systems were running on Honeywell and DEC. No systems were converted. New systems ie. PCS were installed in 1981 which are integrated with the financial systems wherever possible.

Packages are used wherever possible - especially in the financial area. PCS is more customized because it is easy to do so.

There has been a lot of user involvement in the whole process. It is a HOSPITAL project not a SYSTEMS project.

Training has been a major task. Several rooms were equipped with multiple terminals and a printer. Over 1,000 people have been trained in order/entry.

All patient systems are developed under PCS/ADS. Started with ADT, resource utilization in surgery, medical records, o/e - results reporting.

When a patient is admitted notices are automatically printed out at various locations in the hospital to notify various sections (eg. catering) that the patient has arrived.

Nursing assessment is done for each new patient (height, weight, illness, diagnosis, allergies, surgery etc).

The surgery system is done post-operatively and is for charging and inventory purposes. It records doctor, anaesthetist, case cart selections, implants, sutures, cardiovascular charges, supplies in general.

Radiology has "canned" text which is coded. Printing can be delayed if desired.

5 days after discharge all orders are purged. Summary data is retained for analytical analysis. Hard copy is kept in medical records. The film history for each patient is retained and can be displayed when required.

Medical Records abstracting is done from the charts after discharge. MR use information centre tools to produce custom reports.

Lutheran General uses IBM 3083/4381. It has 3,500 staff, 700 beds. There are 66 people in the information division. 4 of these are applications and systems programmers 1/3 are in operations and information resources (information centre, word processing, personal computing etc). The remainder are in customer service - liaison with the users.

MSP Data dictionary is used.

.../2

WANG is used for word processing. No other office automation facilities are provided apart from limited electronic mail.

There is a bisynchronous interface between WANG and IBM (SDLC planned). 40 PC's are used.

Physicians can only access their own patients. There are some call back facilities for external users.

Training for o/e was carried out by 3 nurses used as trainers. 5-6 people were trained per session per trainer. Hands-on training was followed up with exercises. After a group of units was fully trained o/e was installed for each unit.

A support system of 2-4 people available as "help desk" support was provided for a week (3 shifts) until everyone was confident.

A videotape has been produced for hardware training (eg. how to log-on).

RN's and ward clerks are only allowed to use the system. Nurses id's are specific to their unit (ward).

Doctors and ancillaries are trained separately. Trainers are selected from each area and trained. 3 sessions are provided. 1 for the terminal and 2 for on-line functions.

There are also self-study groups available. Most doctors prefer this system.

There is no mainframe backup. There are 2 CICS environments for production - one PCS, one financial systems and 2 CICS environments for testing.

Phantom beds are allocated to allow for mass emergency admissions.

Have used Arthur Anderson extensively and some private consultants.

Arthur Anderson have provided project leadership and helped to prepare a business case to present to the organization. Gradually moving away from the use of consultants to become more self-reliant.

The PCS system in this hospital has a lot of review screens, ie. when data is entered the screen reappears for review before continuing (seems to be a bit overdone and cumbersome).

STANFORD UNIVERSITY MEDICAL CENTRE, PALO ALTO OCTOBER 14, 1985

NT: Jim Brya Deputy Directory, Information Services
Maureen Burke RN.

Stanford is a teaching hospital and a community hospital. About half the beds are community beds.

There are 663 beds which have about 65% occupancy.

There used to be >100% occupancy, but now the out-patients clinics are growing (4-5,000 patients per day) and same-day surgery is popular. There are also community clinics.

About 1,100 physicians are registered at Stanford (700 active). Some also practise at El Camino.

There is a 60 bed paediatric hospital attached to the SUMC but is funded separately.

SUMC has about 70 in-patient admits per day and about 70 transfers. As a regional trauma centre (with its own helicopter) it has a lot of ER cases and has 7 ICU's.

Originally Jim Brya was hired to install the Technicon system (El Camino). Stanford and the vendor could not reach agreement. In November 1982 the Director started looking for an alternative.

In 1983 decided to go with IBM. Wanted the flexibility of the IBM system which he thought would be essential with the DRG system.

It was essential to react to changes in their own time - did not want to rely on a vendor to introduce changes. The PCS/ADS system was also capable of responding to research studies.

Work is progressing with Travenol to interface the laboratories.

The objective was to make the system complementary to physicians and other health care providers (not change their practices to suit existing systems).

Travenol are contracted to provide a "user friendly" medical information system module. This system will include bedside terminals (on a pull down rack).

The new hospital being built is wired for terminals in every room.

Telex 079 colour terminals are used. They are smaller than IBM's and £ the price. Colour and light pens are thought to be essential. Touch screens are being considered.

A protocol converter is used so that cheap Epson printers can be used with most terminals. More expensive and bulky IBM printers are located at strategic points where required.

In the admitting section the light pens were removed. The clerks preferred to use the keyboard. Nursing requires the use of light pens only.

Colour allows you to put more information on the screen - more flexible design. It also allows you to highlight abnormal results.

The mainframe for the SUMC is a 3083 D with 16MB main memory. The University also has a 3084. One day per week the SUMC's data base rolls onto the 3084 for preventive maintenance of the 3083D (IBM says this is due to problems with DASD not the mainframe). The system goes down each night for batch runs.

Only using 30% of capacity at the moment. There are 140 terminals and 40 printers at the moment. Expect to have up to 500 terminals in the next 5 years and a larger mainframe.

The system is wired up to produce a 2 second response time. This is to prevent user discontent in the future when there are more terminals linked in and the extremely rapid response possible now could not be achieved.

The DB has not been archived at all in over a year.

Considering a shadow DB to reduce down-time. This is important for the emergency room and for physicians to have access to results.

Considering the use of RACF for security.

The PCS staff consists of 9 people doing applications/training etc with 2½ concerned with hardware and systems support.

User co-ordinators are designated by their own departments and report to them. One co-ordinator may serve several departments and in that case reports to Information Services.

PCS is the user's system and if they don't feel ownership will not use it. Users help to design the system, code screens etc.

1,600 nurses have been trained. Nursing was divided into regions - each represented on a committee. The representatives spend about 4 hours a week in IS (testing, training etc). They also train "trainers" and produce user manuals, training guides.

The emphasis is on generic rather than departmental training.

Laboratories are using a VAX minicomputer. Admitting data is transmitted to it. Because the labs systems will not be replaced - PCS will be used as a director of data - the data will be stored twice.

6 twisted pairs cables are being installed in the new building. 4 for data, 2 for voice. Fibre optics are also being considered.

All new terminals will use twisted pairs.

Admin/Financial Systems

Patient Accounting is being done on a Data General MV 10,000 and the information downloaded to the 3084.

At midnight the census file from PCS is sent to the 3084. The nursing acuity information is entered at 10pm each night.

Payroll was developed in-house about 10 years ago. 2 years ago MSA was tried without success.

Nurse rostering is done on a Datapoint.

Travenol is assisting Stanford with o/e, nursing management system (up to 16 modules).

SUMC system allows the units to order anything for the patient or the unit, eg. labs, pharm, engineering etc, but results are only supplied for patient care.

A patient care plan is printed out for each shift.

The electronic mail system is used instead of paging whenever possible. Makes the hospital much quieter.

IBM can only supply limited PCS support.

Travenol has recruited heavily from IBM.

LOMA LINDA UNIVERSITY MEDICAL CENTRE, SAN BERNARDINO, CALIFORNIA

Harry McQueen

OCTOBER 16, 1985

Loma Linda has 550 beds.

A complete set of systems is being installed for patient care, financial and administration. Ancillaries tend to be stand alone systems.

The DP department is split into groups to run particular systems.

The Financial/Admin. systems are on the mainframe. Other systems are on DG minicomputers.

About a year ago consultants recommended the combination of DP sections - Compucare was contracted to do facilities management (4 senior staff are from Compucare - rest from Loma Linda).

ADT has been installed. o/e is being installed.

When a patient is admitted data goes through an MV8000 which acts as a communicator to send data to ancillary computers. It has its own data bases. When an order is entered - mainframe → MV8000 → lab computer and back again.

New financial systems are being developed (not PCS) - G/L, cost accounting, accounts payable (GLOBAL Software). These are CICS based with good on-line features.

By 1986 it is planned to install the new PCS Patient Accounting System.

The next work will be in nursing acuity, staffing and so on.

There is a DP staff of 85. 40 are in operations which includes microfilming. The DP budget is \$6 million of which \$1.5 million goes in wages. LL has instructed that this staff must be reduced.

The mainframe is a 3081 - in December will replace with a 3090 Model 200. The 3081 would be adequate for another year but it is financially desirable to move to the 3090 now.

There are 300 terminals into the 3081 and 23 controllers (3274).

A 120 bed community hospital is being added to the system and in the future a nursing home (now being built).

5 people are coding the order management system. ADT was modified a lot but this decision is now regretted. It is better to go in 'vanilla' because now LL can't mount the new patient accounting software without a lot of data base modification.

LL has 80-90% occupancy. It is the only trauma centre east of Los Angeles. There is also a lot of research carried out. It is one of the top medical schools in the USA.

In 1984 there were 160,000 patient days
20,400 admits.

There is a lot of E/R but not much out-patient work. Physicians run an FMO which runs most of the clinics. This allows physicians to supplement their salaries.

It would be more expensive to upgrade 308X's than to switch to 3090.

In order to use software effectively and take advantage of upgrades it is better to plan to change procedures to suit the system and not vice versa.

Susan Krider, RN

As the ancillaries have their own systems it is a problem to decide when the orders should pass into the lab system. Sometimes need to print requisitions from the mainframe as the labs don't want to accession until the specimen arrives.

In Radiology the order is immediately passed through and printed from their computer.

If the ancillary system is down the MV8000 can print the requisitions which can be delivered to the lab. If systems are down it is difficult to get old orders into the computer (the special down-time programme has been installed in the ancillary departments but not in the nursing units).

The problem of o/e for bedside respiratory care hasn't been solved. There is a large amount of data entry required for this - looking at the use of hand-held computers to eliminate the large DPO staff.

Epidemiology only wants positive results in their system. Plan to create flags on certain pieces of information.

In the o/e module there is the ability to cancel orders if it is done before a set time (this is because orders are batched down to the Labs - not sent on-line).

Culture and sensitivity orders - choose the type of specimen - then a programme provides the unique specimen collection instructions which are printed out on the requisition. O/E doesn't replace the medical record - the order is written into the medical record and then transcribed into the system which acts as a communicator of orders.

The menus had to provide a lot of synonyms to cope with different names for the same orders. This would not be necessary if physicians entered the orders as they would know the alternative names.

Each unit has "common order" screens. A memo was sent to each unit to solicit this information and it was checked against past statistics. The 90% rule was used to determine the common orders. There is also an alphabetical list for orders.

Diagnostic Radiology - is not unit specific. One screen for the whole hospital provides a 95% hit rate.

It is important to try to keep the logical flows of the screen the same so that training on 1 test system will be applicable to the others.

In order to reduce sign-on time, there is a common unit sign-on for CICS. The individual is identified at the PCS stage. You cannot expect people to go through 5 screens to sign-on when they only want to look at 1 screen. Badge readers to speed up sign-on are being considered.

Each nursing unit therefore has a general CICS sign-on. This is OK if they stay in PCS, but difficulties can arise if someone comes out of PCS and gets into the other systems.

The question to ask is level of security/confidentiality vs ease of use.

Californian law requires that total confidentiality must be preserved for certain patients (psychiatric, drug abusers, alcoholics). It cannot be disclosed that they are in the hospital. It is a bit difficult to order tests for John Does all the time.

The trauma centre receives a lot of patients with no medical record number and then cannot send orders. The fast version of ADT takes 15 minutes vs the normal 30 minutes. Work is proceeding to cope with emergency admits.

Clinical Systems

Clinical Laboratory System - MUMPS - marketed by Technician and HBO.

Respiratory Care System - MEES?

Cardiology/Epidemiology - "

Tumor Registry MUMPS

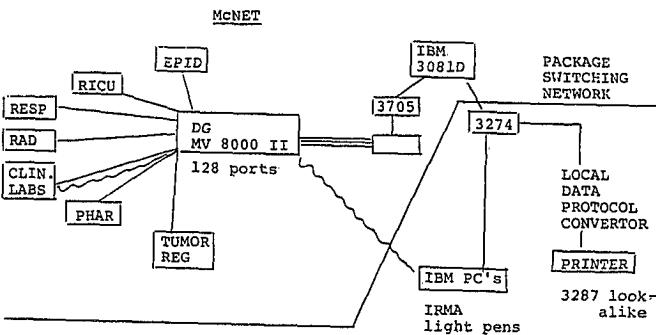
Pharmacy MEES

Radiology ADAC Labs. (Missouri)

A nurse scheduling and staffing system is being developed by Compucare using MEES.

Wesley Knox

Loma Linda has a complicated network which was allowed to develop because individual departments were unhappy with centralized DP services.



The four senior DP positions are held by Compucare (Travenol) personnel.

All the mini-computers are being located in a central computer room. It is expected in the future that better packages that run on the mainframe will be available and the mini-computer can be de-commissioned.

Much more patient data can be kept 'live' on the mainframe than in ancillary minis. This causes problems if enquiries are made about a patient's tests and the lab has purged the data.

All terminals on wards are colour IBM PC's. They have single diskettes and light pens attached to the colour graphics card. Some have an IRMA board and some RS232 so that they can communicate with the minis. Files cannot be downloaded onto the PC's as the emulator does not allow for file transfer.

The resolution on the colour PC monitors is not good but people seem to have got used to it. It is hard to keep the disk drives clean on wards.

Siemens inkjet printers (v. quiet) are used but there are some legibility problems

.../2

Xerox 4045 laser printers are being acquired (much cheaper to run than HP and can produce more copies) at a rate of one per floor (or unit) for chart copies using single sheet feed. It is used for laboratory requisitions - has a bar coding front. A protocol convertor (\$800) is used to link printers to the mainframe. New technology may allow to serially attach to PC's (IBM 7171 protocol convertor which changes ASCII to bisynchronous - \$250 per port and \$15,000).

AS and DISSOS are being evaluated. SPSS is already used.

The data dictionary is maintained on the mainframe for DLL data basis but not done overall. It was attempted a few years ago but was too difficult to maintain.

An information centre facility is being established.

PCS/ADS was chosen for the following reasons:

- flexible
- supported by IBM as strategic state of the art product
- PCS architecture is the only one in which major health systems are being developed
- easy to install
- saves about 2/3 of the time it would take to do it in COBOL

There is an ongoing need for programmers skilled in COBOL, DLL, assembler for some situations.

It is not advisable to allow users to ask for reports under PCS architecture - it chews up CPU time. Another method should be used.

Updating is not done while files are on-line.

Back-up systems/batch updates each night 2am - 3/3.30am.

Considering using shadow data bases to reduce downtime to about 30 mintues.

There is no disaster plan, only some remote tape storage.

PACIFIC HEALTH RESOURCES, LOS ANGELES OCTOBER 17, 1985

Bob Flanagan, President
Dick Chen, Customer Support Centre Director
"Skip" Carr, Marketing Manager

PHR provides DP services to 4 hospitals (1,300 beds) which operate on a not-for-profit basis. It also provides centralized management services for the hospitals so that each one does not have to carry the overheads of its own management structure.

Other hospitals have contracted to use PHR's services.

In 1975 the computing services began. In the average USA hospital about 2% of the budget is spent on DP. PHR costs much less than than.

4 hospitals have PCS provided on-line, another 7-8 use batch systems such as payroll.

It costs 1 hospital \$1.7 million p.a. to have full ADT, O/E, Medical Records (325 beds).

The mainframes used are 4341 and 3083EX. The 3083 will be upgraded to a 3081 in 3 months and then there will be a single CPU environment.

There are 600 terminals/printers in the 4 hospitals.

A work manual has been prepared for the system installation. Block diagrams, each of which has a number of tasks, are used to outline the process.

PCS was installed in 1981. 1 project leader and 4-5 programmers took 18 months to install ADT.

O/E and Results Reporting has 2,000 screens and took 2 years to develop.

Medical Records Abstracts is essential to install for DRG's.

The financial systems are:

Payroll (MSA)
Personnel (MSA)
Inventory (old package to be rewritten in PCS)
GL (IS)

Case Mix Management (PHR)
Cost Accounting (PHR in COBOL)
Patient Accounting (modification of an old IBM package - presently evaluating new PCS Patient Accounting module).

SAS is used extensively with all packages to generate reports.

One hospital uses the message facility extensively - to cut down on paging and phone calls.

PHR has 76 staff -

40 in operations (includes keypunch)
30 in applications divided into 2 groups
(PCS 12 and Batch 18).

Because of an urgent need for an inventory system a Texas Instruments mini-computer and software (\$35,000) is being used as an interim solution. It is estimated that full cost recovery of this outlay will be achieved in 1 year.

A CODAX 6050 multiplexer is used to cut down the number of modems. This allows for data compression and diversion if a line fails. However, if there is a problem it is very complicated to resolve.

Back-up - it is essential to preserve the integrity of the data. Individual systems are not so vital.

A shadow data base, one a couple of hours behind the other, is maintained. It is too expensive to have dual CPU's. Manual procedures are detailed but few users are prepared to follow these if the system crashes.

PHR recommends the use of IBM terminals as it is simpler to control the networks. If a hospital chooses to use cheaper terminals (eg. Memorex at Martin Luther Hospital) they have to take some responsibility for the problems when they occur. Light pens are essential.

Monochrome terminals are mainly used but colour terminals can be very useful in busy areas (eg outpatients registration).

Security - PCS - has password protection

ACF2 - only use the basic part
(the package is more sophisticated than is required).

PHR strongly urges that a 'vanilla' system is installed, users trained - and then changes are discussed.

It is important to maintain a firm schedule. If the hospital doesn't contribute their part - step in and charge them for the service. It is the only way to keep the project on track. The longer it takes to install the more changes are requested. "KISS - Keep it simple, stupid".

Training is a huge commitment, especially in o/e/r.r, but is important and essential to be ongoing.

Once users are used to 'vanilla' they are usually happy with it and don't want bells and whistles (or stop using them after a while).

Vanilla users tend to think of new applications rather than bells and whistles. This is a much better use of resources.

Some changes can have an effect on other functions which you can't predict. eg. queues may become too large and block-outs occur.

John McKay who is the project manager in Singapore is worth talking to. PHR has assisted this project.

Front end planning and firm policy decisions must be a priority.

PHR is being evaluated by IBM as a project management organisation. PHR are sub-contractors to IBM in Singapore.

Hospitals have their own project managers with their responsibilities clearly defined. It is not advisable to encourage the hospitals to become too sophisticated. They then want to have their own systems and begin to operate at different levels. This creates maintenance problems. If a hospital is 'doing its own thing' and has a problem it is very difficult for PHR to resolve it without going back to source code level.

The best person to have at the hospital is someone who understands the system as a project manager - not someone who wants their own machine. It is not necessary to have a DP background. Skills in scheduling, user interaction, project management are more important. There must be a line of communication between the hospital and PHR help desk to keep control of problems, systems etc.

Executive management systems are being designed.

Ancillary departments will be on the mainframe under PCS. It is not desirable to have separate systems - it makes interfacing too difficult.

It may be necessary to allow interim solutions if the PCS module is too far down the track - so long as it is clearly understood that it is interim.

The whole philosophy of PCS is to have an integrated system.

Financial Systems

The successful implementations of the cost accounting system was achieved by the involvement and commitment of every department head. A steering committee of key personnel was established in each hospital.

It took 6 months to install in a 250 bed hospital - using the preferred method.

The reports generated by the cost accounting system can be produced in a variety of ways. Individual departments can use whatever allocation method they like - eg. square metres, linen use - the only restriction is that you must be consistent within a department.

A lot more development is planned in variance analysis capabilities.

Flexible budgeting is a separate product which interfaces as a feeder system. The Nursing Acuity interface is unique to this system.

More than 200 different reports can be produced from the DRG system. Cost Accounting and DRF systems should be linked to get full managerial benefits.

An enhanced mainframe version will be available in mid 1986. PHR has 18 customers for the financial systems to date, including the Sisters of Charity hospitals in Texas.

The mainframe software costs \$40,000 (the enhanced version may be a little more). \$10 - 15,000 for installation costs and the writing of interfaces. PHR will write the interfaces if required or will supply manuals, training, advice etc. The annual maintenance fee is 10%. Future enhancements can be free or if major changes may be charged for. The source code (COBOL) is supplied.

Versions for System 36/38 cost the same. It would be relatively simple to re-compile the mainframe version to run on the System 36 or 38.

MARTIN LUTHER HOSPITAL, ANAHEIM, CALIFORNIA, OCTOBER 17, 1985
(run by Pacific Health Resources).

Nancy Springer RN, Director, Information Services
Stephanie Cunningham.

PHR has installed ADT, Medical Records Abstracts and Financial Systems. Order entry-results reporting is being installed at the moment.

The help desk is manned from 6am to midnight. At the beginning of 'live' o/e it will need 24 hour coverage.

The help desk can solve some hardware problems and systems problems and also accepts requests for new reports, enhancements etc. There is a form to record Problems and Changes. An IBM 3270 PC is being installed to maintain logs of requests, problems etc. This will help to identify sources of problems and will enable the hospital to send requests on-line to PHR.

At the beginning there were 20 calls per day to the help desk. It is now down to 2-5.

The help desk staff are also system analysts.

A lot of the initial problems were 'security-blanket' problems - users were nervous and needed a lot of 'hand-holding' for about 2 weeks, eg. "Please come up and watch me log on". This support was provided willingly and has created a great deal of trust and confidence in the Information Services Section.

The total IS team is about 17-18 people. None of these are EDP people. They have been promoted to IS from within the hospital. One former DPO is in charge of the o/e installation.

The IS section is responsible for the production systems, including data entry for the financial systems. All staff are cross-trained to be able to handle help desks.

Terminals are in every ward and ancillary department. The house-keeping section uses it to organize preparation of rooms as required. The catering section has noticed a reduction of meals prepared and then not required as the patient has been discharged. They can also be quickly notified via the messaging facility if additional or special trays are required.

A competition to name the system was held with an Apple PC as the major prize. A large launching ceremony was held on the day the system went live with the revelation of the winning name (balloons, badges etc). Very successful in terms of PR and acceptance by the users - they see it as their system.

Patients in psychiatric or drug abuse wards are specially tagged so that staff are aware that no information at all can be disclosed about them - it cannot even be admitted that these people are patients in the hospital (by law).

Patient summary charts can be printed out for physicians - each time they do ward rounds, or as required, and are very popular.

DRAFT

PATIENT CARE PROJECT
APPLICATIONS IMPLEMENTATION PLAN

1986 - 1988

STATEMENT OF IBM'S SUPPORT PHILOSOPHY

Advised by IBM by letter, reference TCA97/73/dm/2

on 21 February 1986

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APPENDIX 7
February 1936



IBM Australia Limited

IBM'S SUPPORT PHILOSOPHY

IBM has an outstanding reputation for the quality, and level of support provided to its customers.

1. IBM MARKETING TEAM

The IBM Team

In addition to your IBM representative, IBM's Systems Engineers can make a unique contribution to DVA proposed installation. The quality and depth of this support demonstrates our experience and management competence in all types of computer installations.

IBM Systems Engineers have many tools available which enable them to perform at top productivity. We believe DVA will be convinced of the value of this well proven support team.

What is the IBM Systems Engineering Mission?

IBM Systems Engineering will support DVA in achieving its data processing application objectives. Systems Engineering can offer:

- Information
- Recommendations
- Validation of Technical Plans and Proposals
- Installation Skills (advice and guidance as necessary)
- Experience/Education
- Stimulus
- Special access to uncommon skills

In summary - Practical help, consultation and guidance.

IBM provides marketing activity at the discretion of the IBM Branch Manager to assist its customers to acquire, install and use IBM products and services.
Application development and maintenance are generally considered a major cost item in a data processing budget. By applying its technical support resources to these tasks, IBM could help DVA achieve optimal productivity.

Consistent with these objectives, IBM does not quantify or contract its marketing activities; it endeavours to manage the availability of its staff to best meet the real support needs of its customers and to maximise the professional development of its people.



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Specialist System's Support and Applications Development

In addition to the account team, IBM would make use of an Australia wide network of Systems Engineering Specialists to fulfil its role of advice, guidance and assistance. IBM also has a regular program of visits from leading technical design and programming specialists.

As an extension of the direct IBM multi-level support available, the local IBM branch operation makes use of other technical resources of the company. The work done in various IBM Centres worldwide, is made available to customers either directly or through IBM staff.

The Value of IBM Systems Engineering Support

The value that IBM Systems Engineering Support offers you is summarised as:

- Earlier delivery of benefits to users.
- Minimising the risk in implementation of a complex integrated system.
- Access to a proven local and overseas support structure which provides you with a much wider range of skills and specific application knowledge than a local Systems Engineering team can offer alone.
- The IBM Systems Engineering staff provides flexible staffing, backup and local special skills as needs dictate. This reduces the risk of dependence on particular key personnel, with possible exposure to key projects.
- High productivity from the field IBM SE and IBM CSR because of IBM's major investment in support programs which have proven their value (RETAIN - described later, SECION, Systems Assurance - see next page, AIDS - part of the Marketing Support System).
- Interchange of IBM Systems Engineers by overseas residencies and assignments gives regular technology transfer to DVA staff over the entire life of the installation.
- The organisation of IBM's multi-level support structure gives good access to IBM resources and could mean significant savings for DVA.

In order to ensure that this support achieves the result required by DVA, IBM also offers a Post Installation Audit which is designed to check:

- Achievements against objectives
- Security



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- Progress on major applications
- Installation control procedures in place, e.g. Change/Quality Control
- Progress in Education program and development of self instruction.

PATIENT CARE SYSTEM ARCHITECTURE

From a document provided by IBM on 21 February 1986
reference tca97/73/dm/2



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PATIENT CARE SYSTEM/APPLICATION DEVELOPMENT SYSTEM (PCS/ADS)1. PATIENT CARE SYSTEM (PCS)

It is commonly recognised and accepted that no two hospitals or health-care organisation are alike. As such, the availability of a powerful software tool to compliment available application packages is very important. PCS-ADS is one such tool. It is in the category of application program generators that allow for the quick development of on-line application programs as the programmer concentrates only on the program logic and visual display screen formats. It requires no DP experience for one to be productive in its use.

The use of PCS-ADS, which some consider as a fourth generation language, also introduces a new concept of application development, that of "prototyping". "Prototyping" involves the programmer working together with the end-user in developing directly on-line, the applications. Besides the very significant productivity gains in application development productivity, program maintenance productivity is also increased. This productivity saving is significant when one considers that the average DP installation expends 60-75% of its programming resources on application maintenance.

There are many benefits with the use of PCS/ADS. As an example, it has a very complete online debug facility to enable debugging & testing of a prototype (or production) system while with the end user. Other advantages include transparency of the DB to the coders & maintainers, code generation/translation, support for multi-hospital systems and the ability to support very high transaction rates as the function and complexity grow.

OTHER Applications

There is a huge array of applications available from a number of sources written in PCS/ADS. In addition to these, others are being developed shortly in the Asian Pacific Region. For example a complete blood Transfusion Service system based on PCS/ADS and compatible with the PM data base structure has been developed in New Zealand.



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2. PCS/ADS

Name: PCS/ADS

Latest Release: 1.2

Main Productivity Advantage: PCS/ADS is a framework for application development. Significant productivity advantages can be achieved throughout the application lifetime.

Some of the essential elements for productivity enhancement in PCS/ ADS are:

1. Data independence
2. Logic independence
3. Ease of logic implementation
4. Ease of screen design and coding
5. Ease of printer format design and coding
6. Ability of user personnel (non-data-processing) to perform functions of Items 3, 4, and 5
7. Human-engineered, user-friendly production system

Productivity advantages are found in the two main areas of an application cycle.

i. APPLICATION DEVELOPMENT

Application Framework: PCS/ADS consists of many programs to handle typical application management functions. Input from, and output to screens, error handling, file and database accesses and printing are some of the typical routines provided by PCS/ADS. As these standard routines are available programmers can concern themselves solely with developing application logic and significantly improve development productivity.

Prototyping: PCS/ADS provides an organisation such as DVA the ability to DEMONSTRATE the application functions during the design phase. Actual coded screens are shown to the user to obtain feedback and these screens are available for later use in the application. The effect on application development can be seen in many ways: (1) When demonstrating the application flow there are no data bases or program specifications to change, and the effect of the changes on the design process is helpful; (2) The user is pleased/encouraged to see a working model so soon and becomes more involved in an earnest review of the system; (3) At least one rework after development or production is avoided.



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Interpretive: PCS/ADS is an interpretive language. The Execution Debug facility dynamically displays trace and status information allowing the designer to examine and modify commands and data immediately prior to the execution of each command. This allows the user to bypass the time consuming cycle of problem determination, resolution, source code maintenance, compilation and testing.

Documentation: PCS/ADS assists application development by automating many of the areas of the time consuming and unproductive tasks of documentation. The output of the preparation of application code is in a form which is suitable for inclusion in the application documentation.

ii. MAINTENANCE

PCS/ADS Cross Reference: allows a user to determine the occurrences of data fields throughout his system - on which screens and print formats, files and databases data is used.

Stack Execution Trace/Debug Mode: which can be dynamically entered or exited. This along with the interpretive nature of PCS/ADS increases the ability to understand the flow of the application, allowing very inexperienced people or people with little knowledge of the application to identify and reserve application programmers for the task of application development.

PCS/ADS does more than just provide an application development system for data processing. PCS/ADS extends the application development tool directly to professionals outside of those in data processing and makes productive the entire application development process from the initial conception to production to maintenance/ enhancement.

Subroutines available in which languages: PCS/ADS provides a common interface and routines to allow user programs written in COBOL, PL/I and Assembler to be called from PCS/ADS. Programs written in these languages can make use of PCS/ADS management routines to access user data and command areas and to access all of the facilities provided by PCS/ADS.

Subroutines mainly used for: PCS/ADS provides most of the requirements of on-line applications. This is evidenced by the fact that the Royal Adelaide Hospital has an Admission, Transfer and Separation system written entirely in PCS/ADS. There are occasions where it may be necessary to write a program in a traditional language such as COBOL, PL/I or Assembler. PCS/ADS provides subroutines to allow programmers to access the data and command areas and link to any of the supplied PCS/ADS routines which provide services such as data



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base and file interfaces, the handling of errors, screen and print management and editing capabilities. Primarily, a user written program will use the subroutines to access the command and data areas.

What sort of automatic documentation: Many of the components such as screen formats, print formats and data collections lists (DCL's) produce self-documenting material. Also, the TEXT Management provided by PCS/ADS gives text processing facilities which allow the user to produce formatted documentation. (The PCS/ADS manuals can be provided in machine readable format and are prepared using this facility.)

Catalogued command sequences: PCS/ADS is provided with application code to allow the system administrator to maintain the PCS/ADS system files.

Typical savings achieved: Development Productivity - It has been found that up to 90% of the screen and printer formats can be coded by associates or users as opposed to being done by programmer/analysts thus off-loading some of their workload. The Parkland Memorial Hospital owned and operated by the Dallas County Hospital District in Texas, USA, estimates productivity has been improved by a factor off four at a minimum when judged against other systems, even when they use CICS, DL/I, SPF, and TSO. This four to one factor does not include what they believe to be a better first production design implementation.

Maintenance Productivity - This is almost always an ongoing critical activity. Parkland Memorial Hospital estimate a productivity enhancement of a factor of ten at a minimum as compared with other systems. On several occasions associates have made changes in a few hours that would have taken a data processing professional several weeks in a situation where there was no application. The DP Manager of Sisters of Charity of the Incarnate Word Houston Texas, states that in his installation his maintenance staff is made up totally of trainees.

Customers who have achieved typical savings: There are over 200 separate organisations around the world using PCS/ADS as an application development tool. These range from hospitals of 200 beds to hospital groups controlling 4,400 beds on the one central processor system.

HOSPITAL INFORMATION SYSTEMS

PRELIMINARY STATEMENT OF STAFFING REQUIREMENTS

1985/86 - 1987/88

APPENDIX 10

HOSPITAL INFORMATION SYSTEMS
PRELIMINARY STATEMENT OF STAFFING REQUIREMENTS

	1985/86	1986/87	1987/88
<u>Central PCS Team</u>			
Project Director	Class 11	Class 11	Class 11
PCS Systems Staff	CSO4 CSO3 2xCSO2 2xCSO1	CSO4 CSO3 2xCSO2 2xCSO1	CSO4 CSO3 2xCSO2 2xCSO1
PCS Implementation/ Co-ordination	Class 8 Class 6	Class 8 Class 6	Class 8 Class 6
<u>RGH Concord</u>			
ADP Systems Support	Class 8 3xClass 6	Class 8 3xClass 6	Class 8 3xClass 6
Stores Invent. System Administrator		Class 7	Class 7
PCS Computer Managmt., Operations & User Support	CSO3 CSO2 CA6 CA4	CSO3 CSO2 CA6 CA4	CSO3 CSO2 CA6 CA4
PCS Liaison/Implementation (to merge with Systems Support)	Class 8 Class 6	Class 8 Class 6	Class 8 Class 6
PCS User Staff on secondment		3 staff equiv.	4 staff equiv.
<u>RGH Heidelberg</u>			
ADP Systems Support	Class 8 Class 6	Class 8 Class 6	Class 8 Class 6
Stores Invent. System Co-ordinator		CSO3	CSO3
PCS Computer Managmt., Operations & User Support	CSO3 CSO2 CA6 CA4	CSO3 CSO2 CA6 CA4	CSO3 CSO2 CA6 CA4
PCS Liaison/Implementation (to merge with Systems Support)	Class 8 Class 6	Class 8 Class 6	Class 8 Class 6
PCS User Staff on secondment		2 staff equiv.	3 staff equiv.

	1985/86	1986/87	1987/88
<u>RGH Greenslopes</u>			
ADP Systems Support			
Stores Invent. System Administrator	Class 8 Class 6 Class 4	Class 8 Class 6 Class 4	Class 8 Class 6 Class 4
PCS Computer Managmt., Operations & User Support			
PCS Liaison/Implementation (to merge with Systems Support)			
PCS User Staff on secondment		Class 7	Class 7
<u>RGH Daw Park</u>			
ADP Systems Support			
Stores Invent. System Administrator			
PCS Computer Managmt., Operations & User Support			
PCS Liaison/Implementation (to merge with Systems Support)			
PCS User Staff on secondment		1 staff equiv.	3 staff equiv.
<u>RGH Hollywood</u>			
ADP Systems Support (* not filled)	CSO2* 2xClass 6* 1xCA4*	CSO2 Class 6	Class 8 Class 6
Stores Invent. System Administrator			
PCS Computer Managmt., Operations & User Support			
PCS Liaison/Implementation (to merge with Systems Support)			
PCS User Staff on secondment		Class 8	Class 8 Class 6

	1985/86	1986/87	1987/88
PCS Liaison/Implementation (to merge with Systems Support)		Class 8	Class 8 Class 6
PCS User Staff on secondment		1 staff equiv.	2 staff equiv.
<u>RGH Hobart</u> PCS Liaison/Implementation PCS User Staff on secondment.		Class 6	Class 6
		1 staff equiv.	2 staff equiv.

The Brand Report recommends a six percent staffing increase to support the current workloads of the hospitals. Part of this workload is to provide support, training and maintenance for the computer systems already implemented. Extra staff are needed to provide new services associated with meeting the identified shortfall in current information systems.

These computing staff will be:

- operators looking after the day-to day running of the hardware;
- installing and maintaining hardware;
- training staff in the use of the software and hardware (identified in Brand as a high priority);
- analysing and developing smaller systems;
- servicing requests for modifications to systems.

In accordance with the Brand Report, the Department is seeking approval for an increase in RGH staff, including 47 positions in support of hospital information systems. Staff are required immediately to provide assistance and training to current users, to link together the current hardware in preparation for the installation of the larger machines, and to develop and co-ordinate proposals for future systems.

APPENDIX 4

Chapter 28, Automated Data Processing (ADP)
of Review of the Repatriation Hospital System,
June 1985, Dr I Brand, Chairman

CHAPTER 28

AUTOMATED DATA PROCESSING (ADP)

28.1 Complaints were received from every RGH in relation to their ADP systems and service. With the very high degree of dissatisfaction expressed about this service, the Review believes it is imperative that a major overhaul be conducted of the direction computer applications are taking within the RGH's as a matter of urgency.

28.2 The only mention of the hospitals in the recently completed ADP Survey by Ferris Norton & Associates is in relation to the Patient Care System (PCS). Other computing needs of the hospitals are not specified, making this study quite inadequate as far as the hospitals are concerned.

28.3 The needs of differing areas in the hospitals have not been effectively satisfied by the one type of computer system. It would appear that a major reason for the lack of progress has been the centralised approach in trying to provide global solutions to individual hospital needs.

28.4 No overall strategy for ADP in the hospitals has been developed. An independent study should be undertaken to assess the full data processing requirements of the hospitals and how best to supply those requirements. This must be done in consultation with the hospitals. The central strategy should not be a single priority list, but should incorporate the philosophy that there may be a number of possible solutions ranging from main frames to micro-computers to manual procedures. More than one solution could be implemented simultaneously. While the hospitals should be involved at all stages, it is especially important they be consulted at the beginning when the terms of reference are defined.

28.5 A Hospital Computing Steering Committee should be set up in each RGH. All requests for data processing (DP) equipment and software should go through this committee. The committee should encompass a broad spectrum of hospital personnel who know and appreciate the ADP needs of the hospital, and can advise the Medical Superintendent on these needs. The Committee would represent the RGH centrally and provide local support. It would be responsible for determining the strategic plan for its RGH.

28.6 Each RGH, not the Branch Office (BO), should have a Hospital Information System (HIS) Co-ordinator reporting to the Hospital Computing Steering Committee, but also communicating to the central HIS team (at present the PCS team). The HIS Co-ordinator must be involved in local and central office projects such as PCS and strategic planning. Adequate training is essential. DP staff must be competent in the computing field and not just have a clerical background.

28.7 There must be hospital representation on any BO or Central Office (CO) steering committee.

28.8 CO data processing staff should become personally acquainted with the hospital environment and users requirements.

28.9 It was interesting to note that all the other hospitals said many computer systems were developed only for Concord, and the other States

were forced to accept these systems. At Concord we were told that the systems were primarily developed on the basis of what CO ADP staff believed the hospital should have.

28.10 The different RGH's hear what systems the other RGH's have or are promised, and they feel they are being disadvantaged. Improved communications in this area are essential.

28.11 At Heidelberg the Review was informed of an outpatient scheduling system that the Branch was about to purchase, although not approved by the CO Priorities Review Committee. Other States had asked for similar systems but had been refused.

28.12 Some of the smaller RGH's do not adequately prepare submissions for computer applications. They simply identify a need, submit it to BO which in turn may submit it to CO. However, CO requires a fully documented submission before it will agree to a proposal. The smaller RGH's say that this is a vicious circle. They do not have the resources to fully document submissions, and therefore do not get the required priority for their applications.

28.13 Although the larger RGH's have hospital based ADP staff, many of these individuals are untrained and know little more about computers than the man on the street. The majority have come up through the clerical ranks and provide no more than a stopgap role. As well as little expertise, there is minimal effective planning for microcomputing applications. Clinical staff have nowhere to turn when they seek support or advice on microcomputing answers to clinical problems. This points the need to only employ adequately qualified persons in ADP sections of the hospitals.

28.14 A Patient Care System (PCS) from IBM has been recently purchased by the Department.

28.15 The submission from ADP CO to the Review about PCS seems to be nothing more than advertising blurb.

28.16 This claims that, "Although developed in the United States, this and all PCS packages can be modified with relative ease, using the Application Development module, by the PCS team and hospital staff, to allow its operation in the DVA environment."

28.17 Other Australian experience has been that systems designed for hospital situations in the United States often are quite unsuited to Australian hospitals, and transfer with difficulty.

28.18 We tried to follow through the way the decision had been made for the Department to go into PCS. When questioned at the hospital level, staff emphatically stated they had not been consulted about the decision. Further, the level of explanation to and therefore understanding of PCS by the hospitals is very low, and would not enable hospital staff to make an informed decision.

28.19 When the Review met with the Systems division at CO, they said that the decision was made at a meeting of Deputy Commissioners. In fact it seems to have been made by the First Assistant Secretary (Systems) on the basis of a recommendation by an Assistant Secretary (Systems) in December, 1982.

28.20 The Review questioned the Systems division as to what documentation had been prepared and what studies had been carried out within DVA to support the decision that PCS is the most appropriate system for the Department's use. We were told that a study was performed at Concord, but no copy of this was provided to the Review.

28.21 PCS may be a satisfactory package for the RGH's, but the decision to purchase it and commit the Department to expenditure of many hundreds of thousands of dollars seems to have been taken with no documented consultation with the hospitals. The Department ought not be surprised if PCS does not turn out to be quite what was envisaged for the RGH's.

28.22 Although the initial decision appears to have been taken in December, 1982, progress since then has been monumentally slow. In October, 1984, a PCS project team was assembled at RGH, Concord. The problems encountered by this team as a direct result of CO ADP failing to provide even the most basic resources have already led to a number of resignations from the PCS team, including that of the Director. The initial attempts to establish a PCS team seem to have failed. The Department must take steps to ensure that a future team does not fail.

28.23 Present indications are that the hospitals are most unlikely to have their requirements satisfied. The waste to date in both time and money has been great, and the potential for future waste is enormous.

28.24 If PCS is to succeed the services of a well qualified project manager with a demonstrated track record should be obtained from outside the Department. This person does not need to be medically qualified, but a medically qualified person is required as part of the team to ensure the quality of the system function and to protect the users' interests.

28.25 Major strategies must be defined and ratified so that they are unlikely to change within the time frame of the project. The strategies of concern, which should be decided early in the project, are:-

- Hardware - mainframes for all project stages to and including production for all States.
- Network - the environment for all project stages to and including production for all States. Decisions on whether areas/hospitals other than the RGH's will be included. Strategy required for later packages as well.
- Operational - PCS is an online event driven system requiring many terminal sites and 24 hour operation if batch procedures are to be avoided. This goal should be attained as soon as possible. System response time should be guaranteed and minimal downtime achieved by adequate planning.

28.26 Vendor support from IBM is required. DVA must ensure its interests are protected and that DVA staff have adequate involvement in any area IBM takes responsibility for. At present IBM does not have a full appreciation of hospital requirements at a detailed level.

28.27 An adequate budget for the project must be provided once the project schedule is determined. The project manager must have control of the budget and the project. To date there has been neither an adequate budget nor freedom from interference in the project.

28.28 Staffing for the project including the HIS co-ordinators must be timely and adequate.

28.29 The Review believes that at the whim of CO ADP staff, institutions are forced to adopt systems whether they want them or not. Four of the RGH's have only had very limited data processing skills available to them. Progress has been slow in these hospitals. For too long it has CO has been the central control in data processing resources. For years, requests from the RGH's for ADP systems have been rejected. Generally speaking the hospitals have stagnated in their quest for improved data processing facilities. They have been continually told to wait - "the solution is just around the corner". They have waited and they continue to wait. The corner is never negotiated.

28.30 In some of the larger hospitals personal computers are proliferating, with little Departmental control of the data that is being stored in them and the use being made of them. We were unable to find any policy in relation to personal computers. The Review observed that in a number of instances staff had privately purchased their own computers for use at work because of the difficulty in obtaining one through the system.

28.31 A retraining programme for all VDU operators should be implemented. There is a need for DP training officers and liaison officers, the latter being a most important link in advising CO of local needs and problems encountered by the users.

28.32 While ADP equipment is a high priority it must not be purchased at the expense of delaying urgently required word processors and other screen based equipment.

28.33 RECOMMENDATIONS

- (i) THAT A STUDY BE UNDERTAKEN BY AN INDEPENDENT BODY IN CONSULTATION WITH THE HOSPITALS OF THE FULL DATA PROCESSING REQUIREMENTS OF THE HOSPITALS AND HOW BEST TO SUPPLY THOSE REQUIREMENTS (para 28.2 and 28.4).
- (ii) THAT A HOSPITAL COMPUTING STEERING COMMITTEE BE SET UP IN EACH RGH (para 28.5).
- (iii) THAT A HOSPITAL INFORMATION SYSTEM CO-ORDINATOR BE APPOINTED AT EACH RGH (para 28.6).
- (iv) THAT THERE BE HOSPITAL REPRESENTATION AT ANY BRANCH OR CENTRAL OFFICE STEERING COMMITTEE (para 28.7).
- (v) THAT CENTRAL OFFICE DATA PROCESSING STAFF BECOME PERSONALLY ACQUAINTED WITH THE HOSPITAL ENVIRONMENT AND USER REQUIREMENTS (para 28.8).
- (vi) THAT ONLY QUALIFIED PERSONS BE APPOINTED IN ADP SECTIONS OF THE HOSPITALS (para 28.13).
- (vii) THAT A QUALIFIED PROJECT MANAGER BE OBTAINED FROM OUTSIDE DVA TO HEAD THE PCS TEAM (para 28.24).

- (viii) THAT A MEDICALLY QUALIFIED PERSON BE APPOINTED AS PART OF THE TEAM TO ENSURE THE QUALITY OF THE SYSTEM FUNCTION AND TO PROTECT THE USERS' INTERESTS (para 28.24).
- (ix) THAT MAJOR ADP STRATEGIES BE DEFINED AND RATIFIED (para 28.25).
- (x) THAT AN ADEQUATE BUDGET FOR THE PCS PROJECT TEAM BE PROVIDED AND THAT THE PROJECT MANAGER HAVE CONTROL OF THE BUDGET AND PROJECT (para 28.27).
- (xi) THAT STAFFING FOR THE PCS PROJECT BE TIMELY AND ADEQUATE (para 28.28).
- (xii) THAT THE HOSPITAL COMPUTER STEERING COMMITTEES IN CONJUNCTION WITH CENTRAL OFFICE DEVELOP POLICIES IN RELATION TO PERSONAL COMPUTERS (para 28.30).
- (xiii) THAT A RETRAINING PROGRAMME BE IMPLEMENTED FOR VDU OPERATORS (para 28.31).

APPENDIX 5

Patient Care System (PCS) Project Costs

PCS PROJECT COSTS

1985/86 - 98/5861

Date	Source	Item	85/86	86/87	87/88	88/89	89/90	4 Year Total	5 Year Total
January 1985	NPP (1)	Hardware, Site Preparation, Software Licences and Maintenance Services (Initial Year of Implementation)	2.4	4.1	3.1	0.2		9.8	
	R&H Staff Costs, NCC Specialist Staff Costs		0.15	0.25	0.4	0.5		1.3	
	Ongoing Software (S/W) and Maintenance		0.5	1.95	2.45			4.9	
	Increment to Facilities (Concord and Heidelberg)		0.4	0.6				1.0	
	total (excludes PCS team costs)		2.55	5.25	6.05	3.15		17.0	
July 1985	DISC (2)	Hardware, Site Preparation, Software Licences and Maintenance Services							

PCS PROJECT COSTS

1985/86 - 1989/90 = \$M

Date	Source	Item	85/86	86/87	87/88	88/89	89/90	4 Year Total	5 Year Total
August 1985	NPB AMENDED (3)	Hardware, Site Preparation, Software Licences and Maintenance Services <i>(initial year)</i>	2.6	4.38	3.33	.22			10.53

Initial Year of Implementation)						
R&R Staff Costs, NCC						
Specialist Staff Costs						
Ongoing S/W and Maintenance						
Increment to Facilities (Concord and Heidelberg)						
PCS Team Costs						
TOTAL						
(excludes staff costs, increments to facilities)						
HEARING						
Hardware, Site Preparation						
Software Licences and						
Maintenance Services						
(Initial Year of Implementation)						
Ongoing S/W and Maintenance						
Increment to Facilities (Concord and Heidelberg)						
R&R Staff Costs, PCS Team Costs (AI)						

TOTAL (excludes increments to **GENERAL** (✓))

Date	Source	Item	85/86	86/87	87/88	88/89	89/90	4 Year Total	5 Year Total
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Notes

1. December 1984 prices.
2. 1984 dollar costs.
3. December 1984 prices plus 10% increase for Exchange Rate movement.
4. Includes overestimate for PCS team costs because of additional activities in the 5 year period.

APPENDIX 6

Cost Projections, Appendix D of
 Consultancy Review of Proposed PCS Package Implementation
 at Repatriation General Hospitals,
 July 1985, Disc International Pty Limited

YEAR_1_1985/86

	YEARLY FUND
	\$,000
1. Purchase of Equipment	
RGH Concord	1,600
2. Preparation of Computer site	
RGH Concord	300
3. Software licences and maintenance services	
RGH Concord (last quarter say)	300
4. Contribution to NCC support	
RGH Concord (last quarter say)	25
5. PCS Team Budget	
8 resources (additional facilities plus interface requirements to AIMS.)	400
Plus 5% for Travel and Facilities	20
Technical Consultants and Training organisation	100
6. Operations and Implementation Staff	-
3 resources (Concord Pilot)	150
3 resources (Heidelberg Testing)	150
Budget Estimate Year 1	3,045

YEAR_2_1986/87

	YEARLY FUND
	\$,000
1. Purchase of Equipment	
RGH Heidelberg	1,600
RGH Concord Upgrade	400
RGH Greenslopes	1,400
2. Preparation of Computer site	
RGH Heidelberg	300
RGH Greenslopes	300
3. Software licences and maintenance services	
RGH Concord (Full year)	600
RGH Heidelberg (Last Quarter Say)	255
RGH Greenslopes (Last Quarter Say)	170
4. Contribution to NCC support	
RGH Concord, Heidelberg, Greenslopes	75
5. PCS Team Budget	
6 resources (Mainly Appointment Scheduling)	300
Plus 5% for Travel and Facilities	15
6. Operations and Implementation Staff	
3 resources (Concord Pilot/Production)	150
3 resources (Heidelberg Production)	150
3 resources (Greenslopes Testing)	150
Budget Estimate Year 2	5,865

YEAR 3 1987/88

YEARLY FUND

\$,000

1. Purchase of Equipment

RGH Hollywood	1,200
RGH Daw Park	1,100

2. Preparation of Computer site

RGH Hollywood	150
RGH Daw Park	150

3. Software licences and maintenance services

RGH Concord/Heidelberg/Greenslopes	1,285
RGH Hollywood and Daw Park (Last Quarter Say)	150

4. Contribution to NCC support

Four RGH sites	100
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5. PCS Team Budget

2 resources (General Support)	100
Plus 5% for travel and Facilities	5

6. Operations and Implementation Staff

Four RGH sites 3 resources each	600
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4,840

YEAR 4 1988/89

YEARLY FUND

\$,000

1. Purchase of Equipment

RGH Heidelberg and Concord Upgrade	950
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2. Preparation of Computer site

RGH Hobart (Connection to Heidelberg)	75
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3. Software licences and maintenance services

Four RGH Installations, plus one remote site	2,000
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4. Contribution to NCC support

Five RGH Sites (include Hobart)	100
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5. PCS Team Budget

- resources	-
Plus 5% for Travel and Facilities	-

6. Operations and Implementation Staff

Five RGH sites 3 resources each	750
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Budget Estimate Year 4	3,875
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YEAR 5 1989/90

	YEARLY FUND
	\$,000
1. Purchase of Equipment	-
2. Preparation of Computer Site	-
3. Software licences and maintenance services	
Four RGH Installations, plus one Remote Site	2,000
4. Contribution to NCC support	
Five RGH Sites	100
5. PCS Team Budget	
- resources	-
Plus 5% for Travel and facilities	-
6. Operations and Implementation Staff	
Five RGH sites 3 resources each	750
Budget Estimate Year 5	<u>2,850</u>

APPENDIX 7

Benefits Data, pages 21-24,
Consultancy Review of Proposed PCS Package Implementation
at Repatriation General Hospitals
July 1985, Disc International Pty Limited

TABLE 1
HOSPITAL CHARACTERISTICS

	CONCORD	HEIDELBERG	GREENSLOPES	HOLLYWOOD	DAW PARK	HOBART
No. of Beds in Use	725	408	428	352	300	85
Annual Discharge	18,900	13,568	10,806	9,063	7,300	2,342
Inpatient Days	221,190	116,558	124,645	97,954	81,100	24,703
Average Length of Stay	11.7	8.6	11.7	10.68	10.8	10.8
Overall Occupancy	84%	N.A.	80.4%	77%	74%	68%
Outpatient Visits	190,240	183,320	77,761+	120,000	90,800	32,951
Cost per Bed Day \$	312	311	300	262	273	N.A.

NOTE:

1. N.A. stands for not available
2. Overall occupancy for DAW Park is a daily average



TABLE 2
QUANTIFIED ANNUAL BENEFITS (\$'000)

	CONCORD	HEIDELBERG	GREENSLOPES	HOLLYWOOD	DAW PARK	HOBART
Reduction in LOS	5,307	528	1,216	1,187	400	F
Reduced Work-Load for Nursing Station/Clinical Staff	235	F	415	158	29	F
Automatic Printing of Drug Selection Instructions	5	22	F	F	F	F
Order Status Enquiry	1,040	136	15	T	70	F
Wastage of Consumables	98	F	71	111	15	F
Improved Scheduling	T	48	128	T	10	11
Management Opportunity	T	550	75	T	O	T
	\$6,685	1,284	1,920	1,456	524	11

NOTE

1. All figures are shown to the nearest thousand.
2. "T" stands for a TRUE statement of benefits (i.e. likely to be achieved) in the Benefits Survey, but unable to quantify the likely outcome.
- Similarly "O" denotes a FALSE statement of benefits (i.e., unlikely to be achieved).



The implementation of PCS systems into RGH Hobart with only 85 beds and a 63% occupancy rate, is unlikely to be cost effective. Also, Hobart has concerns that it will not receive the necessary support to counter the high staff turn-over they experience.

To assist your hospital management to determine the potential benefits from implementing PCS systems a number of relevant reports from hospitals throughout the United States were analysed and details circulated to the RGH's. These reports described a series of quantified benefits that had been achieved after PCS systems had been implemented.

The Benefit Survey responses received from RGH Management indicate a similar, although reduced, benefit potential. They provided projections of quantified benefits that could be gained from the adoption of PCS integrated systems in their environment. The figures in Table 2 show a 4.1% estimated benefit against a total budget of \$288 million. In practice due to the Department's dispersed operations this projection could be optimistic a figure of between 3 to 4% is more prudent.

5.4 Projected Cost Estimates

The following assumptions have been made to develop five year cost estimates:

- Projections are based upon 1985 dollar costs
- IBM 4381 or equivalent computers ranging between 2 and 4 mips are assumed based upon projections at RAH for increased processing capacity
- Compliance to NCC standards e.g. MVS/XA operating systems
- Local networks to commence with say 50 terminals per site and expand to an average of 200 terminals each within five years
- Central operations control and support supplied via the existing National Computer Centre facilities
- Resource costs are based upon \$50,000 per person per annum
- Concerning software licences and maintenance services it is likely that discounts for multiple sites would apply of between 10 and 20%. For the purposes of our calculations we have assumed 15%
- To provide for input from Technical Consultants and a specialist Training organisation a provisional \$100,000 has been incorporated into the project cost estimates.

Yearly cost estimates over a five year period are attached at Appendix D of this report.

5.5

SUMMARY OF FIVE YEAR PROJECTIONS

The anticipated costs outlined in Appendix D are of the development and implementation of the PCS system plus the necessary interface requirements (Infection Control, Nurse Loadings, Food Services and the second phase Appointment Scheduling and perhaps extended Orders Entry facilities).

Cumulative Costs \$,000's		
Year 1	3,045	3,045
Year 2	5,885	8,930
Year 3	4,840	13,730
Year 4	3,875	17,625
Year 5	2,850	20,475
Five year estimated costs		\$20,475,000

In order to calculate a simple COST:BENEFIT we have assumed that each RGH achieves NIL benefit in the first year of operation and only 50% of projected annual benefit in the second year.

The anticipated benefits in dollar terms as outlined in Sub-section 5.3 are:

Cumulative Annual Saving \$,000's		
Year 2	3,985	3,985
Year 3	9,657	13,642
Year 4	11,607	25,249
Year 5	1,880	37,129
Five year quantified benefits are		\$37,129,000

$$\begin{array}{rcl} \text{SIMPLE COST:BENEFIT} & = & 20,475: 37,129 \\ & = & 1:1.81 \end{array}$$

The figures above show a break even after three years.

APPENDIX 8

Letter to Departments from JPCA of 21 May 1985
containing guidelines to departments preparing Submissions
for the JPCA



COMMONWEALTH OF AUSTRALIA
JOINT PARLIAMENTARY COMMITTEE OF PUBLIC ACCOUNTS

PARLIAMENT HOUSE
CANBERRA, A.C.T.
TEL. 72 7455

Dear

INVOLVEMENT OF THE JOINT COMMITTEE OF PUBLIC ACCOUNTS IN THE ACQUISITION OF ADP FACILITIES

1. The Joint Committee of Public Accounts has been given a standing reference by Parliament to investigate and report on proposed major acquisitions of ADP facilities by the Commonwealth.
2. This instruction sets out the information requirements of, and procedures to be followed by, the Public Accounts Committee in discharging its duty to investigate and report on proposed acquisitions of ADP facilities by the Commonwealth.
3. The following motion was moved by the Leader of the House in the House of Representatives on 8 May 1985:
 - (1) That, in accordance with paragraph 8 (1) (d) of the Public Accounts Committee Act 1951, this House refers to the Joint Committee of Public Accounts for investigation and report as necessary from time to time, the proposed acquisition of automatic data processing facilities by any Commonwealth department or authority of the Commonwealth staffed under the Public Service Act 1922; notification of intention of which is to be conveyed to the committee by the Minister responsible for the department or authority intending to acquire the facilities.
 - (2) That this resolution will continue in force unless and until amended or rescinded by the Senate or the House of Representatives in this or a subsequent Parliament.
 - (3) That a message be sent to the Senate acquainting it of the resolution and requesting its concurrence.

This motion was subsequently passed by both Houses of Parliament. A copy of the relevant extracts from Hansard is attached.

4. The motion reflects the Government's concern that major ADP acquisition proposals are often of such complexity and raise such important related issues that they cannot be dealt with adequately under the severe pressures imposed by the Budget timetable. It is intended that the Committee's scrutiny of ADP acquisition proposals will occur outside the annual budget process and will precede any Cabinet approval for the commencement of the tendering and acquisition process.

5. Responsible Ministers are therefore invited to submit major ADP acquisition proposals to Cabinet for 'in principle' approval at the earliest opportunity and well in advance of any submission seeking commitment of funds.

6. ADP acquisition proposals (as defined in Finance Circular 1984/7) will normally be referred to the Committee for examination and report where the purchase cost over three years of hardware, related software and specific site preparation, and/or the cost of leasing or renting the same over four years exceeds \$5 million. Referrals to the Committee will be at the discretion of Cabinet.

7. The Committee will look to the proponent department/authority and other agencies currently involved in the ADP planning and acquisition process to demonstrate inter alia that the proposal makes good economic sense and will stand up to public scrutiny, that it is in accord with corporate and ADP strategic objectives and represents the most effective means of achieving these, that industrial relations and employment issues have been fully considered and that the proposal provides maximum benefit for Australia's industrial development.

8. Proponent departments/authorities should provide the Committee with three categories of documents; viz an Executive Summary, Proposal Overview Document and Supporting Documentation.

9. EXECUTIVE SUMMARY - a succinct statement of approximately 5 pages length which summarises in non-technical language the crucial information presented in the Proposal Overview Document.

10. PROPOSAL OVERVIEW DOCUMENT - this should provide description, explanation and argument of a more detailed nature. The document should specifically address issues under the following headings, and may include additional information as deemed necessary by the department/authority or as requested by the Committee. It is not the Committee's intention that information already contained in other documentation should be unnecessarily duplicated here. However, where the information requested under these headings is contained in supporting documentation and reports (eg the Strategic Plan), this should be clearly identified and cross-referenced.

- (i) **Nature of, and justification for the proposal** - a description of the proposed acquisition, and a clear statement of the justification for the proposal in terms of its benefits and costs, including the specific needs which the proposal is intended to satisfy.
- (ii) **ADP objectives** - an overview of approved ADP objectives together with their relationship to authorised departmental/authority objectives and work programmes.
- (iii) **Corporate Plan (Summary)** - a statement of the corporate objectives and plans of the organisation with emphasis on management information systems which are planned or in operation.
- (iv) **ADP Strategic Plan (Summary)** - a description of the present ADP facilities and the major systems operating on them. It should cover future plans, a risk analysis, contingency planning and the involvement of internal audit in the planning process. Comments from the Public Service Board on the ADP Strategic Plan should be included. Any significant differences between the ADP Strategic Plan and the acquisition now proposed should be highlighted.
- (v) **Post Implementation Review** - the outcome of the review carried out on the present ADP systems. Relevant comments made by the Auditor-General and/or internal audit should also be included.
- (vi) **System proposals** - details of the proposed systems that will run on the computing environment being acquired and how these relate to existing systems. This information should include a conceptual description of each system proposed.
- (vii) **Other options considered** - a description of the alternative development strategies and acquisition options considered together with an explanation as to why other options have been eliminated.
- (viii) **Cost effectiveness** - a cost analysis of each option with a detailed benefit/cost analysis of the most promising of these. (It is accepted that in some instances it may prove difficult to attribute definitive dollar amounts to qualitative or intangible benefits.)
- (ix) **Technical considerations** - summary of technical issues including risks and constraints associated with each of the most promising options and how these have influenced the

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- (x) **Policy constraints** - a statement on the extent to which Government policy considerations restrict or influence the determination of available options. Specific justification should be given for a recommended option where it appears to be in conflict with such policies.
- (xi) **Action Plan** - a statement on the planning processes and systems methodologies to be used. This should detail the expected timetable for implementation together with staff required, including contracted staff or consultants, classifications and costs. It should also explain in detail the financial processes in relation to the annual budget.
- (xii) **Industrial issues** - details should be provided of consultation arrangements with users and their staff associations on the proposal, and of industrial relations issues which have, or are expected, to arise. The results of a job impact study showing, inter alia, the effect the system is expected to have on staff levels and classifications and on occupational health and safety should also be included. The study should have been developed in consultation with the appropriate staff associations.
- (xiii) **Australian Industry Participation** - an outline of the hardware, software and services that could be supplied by Australian industry with particular reference to offsets and government purchasing preference. If no such participation is thought possible, reasons should be given.
- (xiv) **Proposed Method of Acquisition** - by public tender or Certificate of Exemption. If the latter is used the reasons should be stated and if they are commercially sensitive the Committee should be informed. A statement should also be made about the proposed method of acquisition, e.g. by lease, rent or outright purchase and justification given for the preferred option.
- (xv) **Consultation** - a copy of any relevant comments submitted by the Public Service Board, Department of Finance, CSIRO, Department of Employment and Industrial Relations, Department of Local Government and Administrative Services and the Australian Audit Office, private consultants and staff associations.

- (xvi) Consequence of not proceeding - an assessment of the consequences and risks incurred in the event that the proposal does not proceed.
- (xvii) Advanced technology - an assessment of the extent to which the proposal involves the use of advanced technological facilities not yet in common use within the private sector and/or the public sector.

11. SUPPORTING DOCUMENTATION - departments/authorities should also include in their submission to the Committee copies of pertinent supporting documentation including:

- the most recent version of their ADP Strategic Plan
- the current Corporate Plan
- a Job Impact Study Report
- any independent consultant's reports on the proposal

12. It will be the Committee's policy to avoid delaying the tender and acquisition processes unduly. It is in the department's/authority's interests to ensure that it provides the Committee with the information outlined above as soon as possible so that the Committee's investigations are progressed in an orderly and timely manner.

13. It is expected that the head of the department or authority concerned will attend the Committee hearings to explain the need for the acquisition and their personal commitment to its success.

14. The Committee will make its recommendations in reports to Parliament from time to time. Should the Committee's report be completed and the Parliament not be sitting, alternative arrangements will be made to release the report. Changes to the Committee's requirements will be advised as appropriate.

15. Should you require clarification of any of these requests or wish to offer constructive comment on them, I would be pleased to discuss the matter with you.

M J Talberg
M J Talberg
Secretary
21 May 1985