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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed construction of a

RADIO AUSTRALIA BOOSTER STATION

at

DARWIN, NORTHERN TERRITORY

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

RADIO AUSTRALIA BOOSTER STATION,

DARWIN, N.T.

REPORT

By resolution on 22nd April, 1964, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report, the proposal to erect a Radio Australia Booster Station at Darwin, Northern Territory. The Committee have the honour to report as follows :

GENERAL

1. The Committee heard evidence from representatives of the Department of Works and the Postmaster-General's Department and from the Town Planning Officer of the Northern Territory Administration. This was supported by plans and models of the building and aerial systems. An inspection was made of the Radio Australia studios in Melbourne, the transmitting station at Shepparton and the booster station site at Darwin.

THE ACTIVITIES OF RADIO AUSTRALIA

2. Radio Australia broadcasts programmes to South East Asia for 208 hours per week in English, Indonesian, Chinese (Mandarin and Cantonese), Vietnamese, Thai and French. There is justification for the belief that the views expressed in the programmes are considered seriously and reported widely. In 1962/63 Radio Australia received some 283,000 letters, 80 per cent of which originated in Asian and South East Asian countries. It is extremely difficult to assess the number of people who listen to the programmes but, based on the practice adopted by the Voice of America of relating audience size to the number of letters received annually, Radio Australia would have an audience of 56,600,000 on any one day. This is, of course, a very rough estimate.

THE NEED FOR A BOOSTER STATION

3. The Radio Australia programmes which originate in studios in Melbourne are transmitted from Shepparton to the South East Asian area.

By virtue of the distance from the audience and due to the properties of radio transmission, signals in the 19 to 41 metre bands are not as reliable as those from a station closer to the South East Asian area would be. The great majority of radio receivers in South East Asia are inexpensive transistorized sets with their short wave band limited mostly to the 19 to 41 metre range. More suitable for very long range broadcasts are the 11, 13 and 16 metre bands but the relative absence of sets to receive such transmissions makes broadcasts in this range less effective.

4. Of more importance, however, to the effectiveness of broadcasts, is good signal strength. At the present time short wave bands are becoming more and more congested and other countries are increasing the power of their transmissions with the consequence that Radio Australia broadcasts are becoming more susceptible to interference from transmitters operating on adjacent frequencies.

5. For Radio Australia to become more assertive and less susceptible to interference, it is necessary for the transmitted signal strength to be greatly increased.

AUDIENCES TO BE SERVED

6. Areas to which Radio Australia broadcasts will be directed are :-

Area 1	Indonesia and Malaysia	Including: Malaya, Singapore, Sabah, Sarawak, Brunei, Borneo, Sumatra, Java, The Celebes.
Area 2	South East Asia	Including: Thailand, Laos, North and South Vietnam, Cambodia, Burma, Malay Peninsula.
Area 3	South Asia	Including: India, East and West Pakistan, Ceylon, Western Burma.
Area 4	Near North Islands	Including: West Irian, The Moluccas, The South Celebes, Timor.

Only areas 1 and 2 are to be catered for initially.

THE DETERMINANTS FOR A BOOSTER STATION

7. Increased signal strength could be achieved by increasing the power of the transmitters at Shepparton. However, they would

need to be four times as powerful as transmitters in the Darwin area and the difference in operating and capital costs would be so great that this solution would be uneconomical.

8. Reference has already been made to the preference for broadcasts to be in the 19 to 41 metre bands. Greater benefit from the use of these frequencies would be obtained from transmitters at Darwin, 2,000 miles closer to the audience than Shepparton. Boosting the transmission through Darwin would not detract from the quality of the signal.

9. For these reasons, the Committee are satisfied that the establishment of a booster station at Darwin will provide the best means of giving the added signal strength necessary to provide good radio reception for Radio Australia audiences in South East Asia.

THE SITE

10. After many locations had been examined, it was found that the Darwin area would be the most satisfactory for the establishment of a booster station. It is as close as possible to the audience, it has a reliable source of power nearby and is in a direct line to receive signals from Shepparton.

11. Other radio installations in the Darwin area would suffer interference from a booster station south or east of Darwin and locations further inland could interfere with high frequency communication with aircraft flying on the inland air routes converging on Darwin. Cox Peninsula, across the harbour west of the town of Darwin, provides a site from which transmissions can be made without interfering with other installations. In addition, it is reasonably close to the Darwin power supply.

12. Large separated areas are required for the sensitive receiver station and high power transmitting station so that there will be no inter-action or interference between the two installations. There is sufficient land on Cox Peninsula to meet this requirement. The area has the added advantage of the absence of nearby development and meets the need for flat ground to provide good signal propagation.

13. Satisfactory access to the area is available either by launch across the Darwin Harbour or overland along Bynoe Road. The site for a proposed jetty is approximately six miles by sea from Darwin with further road distances of approximately three miles and ten miles to the receiver and transmitter sites respectively. By road from Darwin the distance is approximately 100 miles.

14. Approximately 7,500 acres will be reserved for the transmitter site and 5,100 acres for the receiver site. A small area will also be required for the jetty beach head and associated store building. With the exception of a small area of freehold at the transmitter site all the area is crown land, some portions of which are under lease and negotiations will be entered into for acquisition, access or transit rights as the case may be.

15. The Committee have concluded that the area chosen for the development of a booster station for Radio Australia is most suitable.

THE COMPONENTS OF THE PROPOSAL

16. Three components will combine to make up the booster station complex. They are :

- the transmitter building and equipment, supporting buildings and services and the masts and aerial arrays;
- the receiver building and equipment, masts and aerial arrays and
- the jetty and associated buildings needed to provide access to the station by water.

These components will be served by water, sewerage, electric power and road access.

THE RADIO INSTALLATIONS

17. Receiver Installations. Highly directive receiving aerials designed to minimize possible interference from the booster transmitters, from foreign broadcasts and from deliberate jamming will pick up the Shepparton transmissions. The signals will be fed into receivers of the most modern design incorporating features to reduce, as much as possible, the distortion and fading so often noticeable in short-wave reception. The programmes will then be relayed to the transmitter ten miles away by a very high frequency radio link.

18. The opportunity will be taken to incorporate in the receiver installation the aerials and receivers associated with the Australian Broadcasting Commission Station, 8DR Darwin. This will overcome the need to provide separate facilities at considerably higher cost.

19. Transmitter Installations. Other existing and planned transmitters to serve South East Asia, in competition with Radio Australia, are or will be transmitting at a power between 200kW and 500kW. To provide satisfactory signal strength relative to other transmissions, broadcasts from Darwin would need to be of a power of at least 200kW. Tenders received for the transmitters indicate that current practice in the industry is to provide equipment with a power output of 250kW. Transmitters of 250kW are therefore to be installed.

20. In order to broadcast to audiences located in different areas, and because of the need for simultaneous transmission of programmes into these areas, three transmitters will be required initially. Ancillary equipment will include large power transformers and heat exchangers necessary for the removal of the large quantities of heat generated.

21. Output of the transmitters will be fed to the aerials through a matrix switch designed by the Australian Post Office. This will give each transmitter access to each aerial by remote control from the control room.

22. In order to provide a more powerful and satisfactory signal than could be achieved by omnidirectional aerials, short wave broadcasting stations use directional aerials. The directive aerial system will consist of masts approximately 260 feet high between which will be hung curtain arrays of transmitter elements. The orientation of the aerial system will be designed to direct signals into particular areas and separate aerials will be necessary for each.

23. Although no figure was given when the proposal was referred to the Committee the evidence discloses that the estimated cost of all the components is £2,704,000. The reference does not apply

any limitation to the extent of the inquiries but it is obvious from the evidence presented that only those items covering buildings and engineering services under the control of the Department of Works are intended for examination. This excludes the transmitters and receivers and their associated equipment, the matrix switch, the aerial curtain arrays and the masts which are estimated to cost over £1 million to provide and install. No itemised estimates were given for these components although reference was made to them in some detail in the evidence. A report on this proposal without reference to the radio installations would be incomplete and would leave the Parliament without a proper appreciation of the proposal.

24. Whilst it has been the practice to exclude from the reference to the Committee, equipment to be installed in post office exchanges for example, we believe that such omissions should not be the rule in all cases. This project provides a good example because of the amount of outside construction work associated with the technical equipment not included in the reference.

25. It is suggested that the criteria used in this case should be reviewed to establish whether the exclusion of some elements of the proposal from reference to the Committee can be defended.

BUILDINGS

26. Receiver Building. The single storey receiver building will have an area of approximately 4,000 square feet and will contain facilities for use both by Radio Australia and the Australian Broadcasting Commission. It will contain a receiver hall with control rooms, a monitoring room and a radio link room to provide accommodation for the programme link equipment for both Radio Australia and 8DR Darwin. There will be space for equipment for monitoring programmes from overseas and for radio telephone links between the booster station and Darwin. Space will be provided for stand-by power plant, air treatment plant, workshop, storage and a lunch room. An annexe will provide the electrically shielded housing for the power transformers and space for storage with vehicle access. A separate small building will house fire pumps and water treatment plant.

27. The building will be constructed in concrete brick work and in order to prevent minute electrical sparking which would cause severe interference to the receiver, metal work will be kept to a minimum. Where metal is used it will be welded or otherwise electrically bonded and earthed in order to maintain full electrical continuity. The roof frame will be welded steel trusses and as the roof cover must be non-metal, corrugated asbestos cement sheeting will be used.

28. Transmitter Building. The transmitter building will be the largest of those proposed for the booster station. It will be a two storey structure with a single storey annexe. The ground floor will contain the transformers and ancillary equipment. To permit handling of the heavy transformers, a rail system will be installed. Space will also be provided for a workshop and store with vehicle access, a mechanical plant room, a construction centre for the assembly and maintenance of transmitter equipment, and a valve store. The transmitters will be on the upper floor together with control rooms, offices and a maintenance workshop serving the transmitters.

29. The building will be framed in structural steel, concrete encased for fire protection, will have reinforced concrete floors, concrete brick walls and welded steel trusses. As the roof must be highly conductive, copper sheeting will be used. All metal work will be earthed and bonded together so that no electrical potential, which may create hazards to staff or interference with the proper operation of the transmitters, can be induced into the building fabric.

30. Administration and Amenities Building. The building to provide accommodation for administrative and clerical staff and for general recreational facilities will be constructed at the transmitter site. Provision will be made for meal preparation and the storage of food for day to day and emergency needs, and bedding. Emergency food supplies and bedding are needed in case the Darwin harbour becomes impassable by launch. The building will be of contrete brick wall construction supporting welded steel roof trusses with copper covering.

31. Power House. A power house located at the transmitter site will accommodate the emergency generating plant and a workshop and store. It will be some distance from the main transmitter building to avoid vibration and noise problems during testing and emergency operation of the generators. It will be grouped with the electrical sub-station and fuel storage to give economy of installation and convenience of operation for the power house. It will be framed with rigid steel portals with concrete brick infill panels and asbestos cement cladding.

32. Vehicle Shelter and Line Store. A fully equipped motor vehicle workshop will be provided because of the comparative isolation by road of the booster station from servicing facilities available in Darwin. The building will contain facilities for line storage and the maintenance of equipment and vehicles, and garaging. A tea preparation room will be provided for staff who will be in continuous attendance. It will have a reinforced concrete floor, concrete brick walls and welded steel roof trusses.

33. Jetty and Associated Buildings. A passenger and light goods jetty approximately 500 feet long will be constructed at Picnic Cove on the western shore of Darwin harbour. It will be constructed of steel piles and pile bracing with reinforced concrete deck supported on steel headstocks and stringers. The piles will be treated by sand blasting, primed and painted with epoxy resin paint to protect them against rust and corrosion. In addition, steel piles below sea level will be cathodically protected. The jetty head will consist of two sections - one will be a series of stepped landings to allow passengers to disembark at all stages of the tide and the other will be a horizontal area supporting a fixed one-ton crane for unloading stores and maintenance equipment.

34. There will be a building at the jetty for covered storage of goods delivered from the launch and for the vehicles which will carry staff and equipment between the jetty and the transformer and receiver sites. A lunch room and toilets will be provided for the boat crew, staff working in the area, and people waiting at the jetty during transit. It will be a galvanized structural steel framed

structure clad with corrugated aluminium sheeting to resist corrosion.

35. Finishes. Brickwork will be untreated externally but a clear plastic sealer will be applied internally for dust prevention. Concrete surfaces will be finished "off the form" and given the same internal treatment as brickwork. Internal timber partitions will be covered with pre-finished hardboard linings. Floors will be generally granolithic with vinyl tiles, non-conducting rubber or timber mosaic parquet for functional purposes in special working areas and the amenities block. Ceilings generally will be suspended and finished with non-combustible asbestos board. In selected working areas the surface will be non-inflammable acoustic tiles. Landscaping will include new tree planting and the development of some garden areas particularly around the administration and amenities buildings.

36. Construction of the various buildings as proposed is recommended.

ROADS

37. Bynoe Road which is a dry weather track provides access to the site from the Stuart Highway some 60 miles to the south east. It will be improved to give better access for construction and maintenance of the booster station. After improvement the standard will be such that access will be unlikely to be restricted for periods longer than one week in the wet season. This degree of accessibility will meet the maintenance requirements of the Postmaster-General's Department. It will also be necessary to divert Bynoe Road a distance of 1½ miles around the western and northern boundaries of the receiver station site.

38. To permit vehicles carrying staff, stores and fuel to ply regularly between transmitter station, receiver station and jetty approximately 12¼ miles of bitumen surfaced roads will be constructed. Internal roads at the two stations will be bitumen surfaced and provided with kerbs and channels. Gravel running tracks will give access to the aerial arrays.

39. Road construction as proposed is recommended.

POWER SUPPLY

40. The electric power required for the booster station could be provided either by generating at the site or by drawing on the resources of the Darwin Electric Supply Authority. The estimated maximum demand for the booster station is 2,800kW with an estimated annual consumption of 15 million kW hours. When additional plant to be installed at the Darwin Power House is in use early in 1967 there will be adequate generating capacity to meet all demands in the Darwin area including that of the booster station.

41. The most economical way to transmit power to Cox Peninsula is by submarine cable across Darwin Harbour. Apart from a saving of some £200,000, this means of transmission is preferable to an overhead line because of lower transmission line losses, lower maintenance costs and less risk of interruption to supply due to the high incidence of lightning in the Darwin area.

42. From investigations so far carried out and arising from discussions with the Department of the Navy, the Harbourmaster at Darwin and other local identities, it has been concluded that the bed of the harbour is quite satisfactory for laying a submarine cable and no difficulties are foreseen. The proposed capacity of the cable would be sufficient to handle a large increase in the power requirements of the booster station.

43. A close study has been made of the two alternatives and the use of a transmitted supply from the Darwin Power House has been recommended. The following comparison of estimated capital costs reveals that a transmitted supply would give an estimated capital saving of £76,000. It will be observed that with a transmitted supply emergency generating plant would be needed.

Components	Transmitted Supply from Darwin	Local Diesel Generation at Transmitter Site
Estimated cost of Diesel Generating Plant, Power Station Building, 11kV indoor switch gear and local fuel oil storage	£190,000	£340,000
Estimated cost of facilities for delivery of 3,500 tons of fuel oil per year from tanker berthed near Picnic Point, Cox Peninsula	-	£240,000
Estimated cost of 11kV transmission lines from receiver site to transmitter site	-	£30,000
Estimated cost of 66kV overhead lines, submarine cable and 11kV lines and 66kV substations	£400,000	-
Estimated cost of housing at £7000 each	£42,000	£98,000
Total	£632,000	£708,000

44. Based on a recommended tariff of 1.57d. per unit and allowing for all other costs including interest, depreciation, maintenance charges, etc., and the emergency diesel generating plant, it is estimated that a transmitted supply from the Darwin Power House would cost £152,000 per annum compared with an annual cost of £159,500 if electricity was generated at the transmitter site.

45. Despite this estimated annual saving of £7,500 with local diesel generation, a transmitted supply is preferred for the following reasons:-

- The provision of operational and maintenance staff for diesel plant operation on the site would be a very difficult problem in a location as remote as Cox Peninsula.
- The elimination of continuous noise and possible vibration would be an amenity attractive to all staff working in the area.
- There would be some improvements in the overall economics of the Darwin Electric Supply Authority (about £47,000 per annum above the marginal costs) thus benefiting the other consumers.
- The availability on Cox Peninsula of transmitted electricity supply from the Darwin Power House would provide an impetus for further development in the Cox Peninsula area.

46. In addition, it has been asserted that, as a broad principle, the Postmaster General's Department should purchase its electricity requirements from the local supply authority when it is available on reasonable terms.

47. If a decision was made in favour of locally generated supply, the Postmaster-General's Department should not be expected to provide electric power for residential purposes in the event of urban development on Cox Peninsula - a transmitted supply from Darwin to the area would be required. We support the view that the Postmaster-General's Department should take advantage of authority generated power particularly when benefit will accrue to the local community. These reasons, together with the estimated saving in capital cost outweigh the advantage in annual charges which a locally generated supply would give.

48. The Committee recommend the use of transmitted electric power from the Darwin Power House by means of a submarine cable across Darwin harbour.

MECHANICAL AND ELECTRICAL ENGINEERING SERVICES

49. Mechanical engineering services will include emergency diesel generating plant with auxiliary equipment, air-conditioning, mechanical ventilation, cranes and hoists, fire pumps and portable extinguishers, hot water supply, kitchen equipment, drinking water coolers and sump pumps.

50. Emergency Generating Plant. Should there be a failure of the power supply from Darwin, it is essential that the interruption to programmes should be of the shortest possible duration. To meet such an emergency, it is proposed to install one 80kW automatic start diesel generating plant complete with auxiliaries and fuel storage to serve the receiver installation.

51. Two 1500kW emergency generating sets will be installed in the power house building to serve the transmitter installations in order to meet similar emergencies. Because these larger sets will be relatively slow in starting an 80kW automatic start set will be provided to serve essential equipment until the main plant can take over.

52. Air-Conditioning and Mechanical Ventilation. The control room and other rooms along the south eastern wall on the first floor of the transmitter building and the main distributing frame room on the ground floor will contain equipment that will require air-conditioning for efficient operation and maintenance.

53. To ensure freedom from dust a number of mechanical supply ventilation plants will be provided to serve the transmitter hall on the first floor and transformer rooms, construction centre, valve store and conditioner and battery room on the ground floor. A small exhaust fan will be supplied for the first floor toilet.

54. A large portion of the receiver building comprises equipment, programme monitoring and control rooms, the proper functioning of which depends upon adequate temperature and humidity control and a high degree of air filtration. It is therefore proposed to air-condition these areas along with the supervising officers' room, lunch room, store and emergency staff quarters. The emergency power plant room and toilets will be individually mechanically ventilated.

55. It is intended to air-condition the major portion of the administration and amenities building, a small portion of dehumidified air being supplied to the locker rooms to prevent the growth of fungi in clothing. Conditioned air for the building will be carried in ducts from plant located in the transmitter building plant room. The kitchen, equipped to cater for staff living in during emergencies, and toilets will be individually exhaust ventilated.

56. Air handling and refrigeration plants will be of conventional and proven types and 50 per cent stand-by refrigeration capacity will be provided.

57. With the provisions made, 39 of the total staff of 65 would normally work in air-conditioned areas. By the provision of window units in the offices at the power house and the vehicle shelter and in the lunch room at the jetty building at an estimated additional cost of £1,000, the number who would benefit from air-conditioning would increase to 49. The remainder would be either working in the power house, the air-conditioning of which is impracticable, or engaged on outside activities.

58. Mechanical Handling Equipment. In the loading bay and heavy equipment store situated at the end of the transmitter building, there will be a fixed 25 ton electric hoisting block located over the loading bay for handling transformers and a 10 ton, 50 feet span overhead electric travelling crane for handling materials in the heavy equipment store. Associated with the 25 ton hoisting block will be two rail mounted trolleys for moving the transformers from the loading bay to any of the three transformer rooms, the service bay or the power house.

59. On the ground floor of the transmitter building, a six ton overhead electric travelling crane will be provided in the corridor. It will be capable of moving out over the loading bay and serving the mechanical plant room, construction centre, battery room, valve store and transformer areas. A three ton electric monorail hoist on the first floor will provide handling facilities for equipment in the transmitter hall and adjacent rooms.

60. The power house building will be provided with a 10 ton electric overhead travelling crane and a manually operated three ton monorail hoist will be situated outside the vehicle shelter and line building for handling material in the line yard.

61. Water Supply and Sewerage. Good quantities of potable water have been obtained from exploratory bores. At the transmitter and receiver sites, water will be pumped from ground water beds to elevated storage tanks by electrically driven deep well pumps. Additional fire fighting reserve will be provided by a ground level storage tank. Mains will be reticulated to fire hydrants and domestic service connections. Booster pumps will be connected to the fire hydrant system.

62. Sewers will collect waste water from all domestic fittings for septic disposal. Small diameter service pipes will be of copper, bonded to the building earth mats and large metallic pipes will be electrically bonded.

63. Electrical Engineering Services. Electrical engineering services will include low voltage reticulation and area lighting,

lighting and power in the buildings, an accurate clock system, early warning fire detectors and thermal fire alarms and a service lift in the transmitter building.

64. With the proviso that window air-conditioning units at an estimated additional cost of $1,000 be installed in the offices at the power house and the vehicle shelter and in the lunch room at the jetty building, the provision of mechanical and electrical engineering services as proposed is recommended.

STAFF

65. The total staff to be employed at the booster station will be 65 with a maximum of 44 on duty at any one time. Amenities will be provided in accordance with the Commonwealth Amenities Code.

66. The possibility of providing residential accommodation on Cox Peninsula has been examined but it is considered that personnel would have a strong preference for living in the town area where all normal facilities would be available to themselves and their families rather than living as an isolated community remote from social life. Unmarried members, in particular, would be most reluctant to live under these conditions. For these reasons, it is intended to find accommodation for the staff in Darwin.

67. The Committee believe that any proposal to accommodate staff in an isolated area would be an impediment to recruitment and could generate social frictions which would have serious effects on morale. For these reasons, we believe that, in the absence of substantial residential development on Cox Peninsula, the staff should be accommodated in Darwin where they can take advantage of community living with which is associated social contact and the enjoyment of normal town amenities.

ACCESS TO THE BOOSTER STATION

68. It is considered impracticable for staff to travel to and from the booster station by the overland route which is some 100 miles from Darwin. It is therefore intended to give daily access by launch

across the Darwin Harbour, then by bus to the transmitter and receiver sites. A suitable vessel to provide a reliable service in all but the most exceptional weather conditions is expected to cost about $20,000 Slipping and handling facilities for a launch are adequate in Darwin but a jetty will be required at Cox Peninsula - reference has already been made to this. Under this arrangement, although no determination has yet been made, it is expected that staff will be regarded as commencing and ceasing duty at the Darwin wharf and will be paid on this basis.

69. Facilities will be provided for people to sleep overnight in the administration and amenities building and at the receiver building when travel is interrupted due to bad weather or breakdown of the launch. As already mentioned, it will be possible to gain access to the booster station by road from Darwin.

FUTURE EXPANSION

70. In the future, it may become necessary for Radio Australia to increase its services into South East Asia and the buildings have been designed so that they can be extended readily. Also involved in any extension of the service would be the erection of additional masts and aerials and the matrix switch will be so designed that it will be able to cater for such additional requirements.

INFLUENCE OF THE PROJECT ON THE DEVELOPMENT OF DARWIN

71. The establishment of the proposed booster station will have the effect of providing the Cox Peninsula with a transmitted electric power supply, convenient access to Darwin and improved access by the more circuitous overland route. It could be regarded as providing the nucleus for residential development. In addition, there are features of the development of the Darwin town layout which are disturbing to the town planning authorities and for which residential development on Cox Peninsula could provide an attractive counter.

72. Reference to the evidence by the Town Planning Officer of the Northern Territory Administration will reveal in more detail than this report potent reasons why urban development on Cox Peninsula should receive serious consideration.

73. We wish to draw attention to the possibility of early development of Cox Peninsula for residential purposes and to stress that if this is likely care should be taken to ensure that such services as electric supply and sea and overland access to be provided for the booster station will be of sufficient capacity to meet such an eventuality.

74. Our recommendation is that all the authorities involved should confer at the earliest possible date to determine whether and if so, when, Cox Peninsula is to be developed for residential purposes. If development is to commence in the reasonably near future, the advantages of co-ordination and dual use of services should be studied to produce the most economical solution without detriment to either proposal. We emphasize, however, that these considerations should not hinder progress in the establishment of the booster station.

ESTIMATES OF COST.

75. The estimated cost of the work proposed is £1,533,000. Details are as set out below:-

	£	£
Receiver Building	45,000	
Mechanical Engineering Works	24,000	
Electrical Engineering Services	5,800	
Water Supply and Fire Fighting	6,700	
Sewerage	800	
Portable Field Sheds	1,400	
	83,700	83,700
Fire Pump House and Water Treatment Plant - Receiver Site	1,100	1,100
Transmitter Building (including Workshop and Stores Building)	222,000	
Mechanical Engineering Works	52,600	
Electrical Engineering Services	24,250	
Water Supply and Fire Fighting (to transmitter area)	15,600	
Sewerage (to transmitter area)	2,650	
	317,100	317,100

	£	£
Administration and Amenities Building	46,000	
Mechanical Engineering Services	13,000	
Electrical Engineering Services	4,520	
	63,520	63,520
Power House	24,000	
Mechanical Engineering Works	174,000	
Electrical Engineering Services	7,400	
	205,400	205,400
Vehicle Shelter and Line Building	18,000	
Mechanical Engineering Services	700	
Electrical Engineering Services	880	
Storage Racks	6,000	
	25,580	25,580
Fire Pump House and Water Treatment Plant (transmitter site)	3,800	
Electrical Services	600	
	4,400	4,400
Flammable Liquid Store	1,600	1,600
Aerial Array Control Building	1,000	
Mechanical Engineering Services	200	
Portable Field Sheds	2,100	
	3,300	3,300
Jetty, Garage and Store Terminal Building	8,000	
Mechanical Engineering Services	500	
Electrical Engineering Services	300	
Water Supply and Fire Fighting	2,100	
Sewerage	650	
	11,550	11,550
Roads and Associated Works		
Connecting roads between jetty, receiver station and transmitter station	165,000	
Internal roads, sealed with kerb, gutter and stormwater drainage	25,000	
Gravelled roads to aerials	25,000	
Deviation of Bynoe Road	2,000	
Manproof fencing around both stations, 5½ miles of cattleproof fencing, clearing of sites (ca. 800 acres) site works, grassing and tree planting	23,000	
Improvement of Bynoe Road	15,000	
	255,000	255,000

	£	£
Hydraulic Engineering Services		
Bores, pumps and rising mains	12,500	12,500
Jetty Facilities	65,000	65,000
Power Supply	483,500	483,500
		£1,533,250
	Say	£1,533,000

The estimated cost of the whole project is £2,704,000 of which £1,171,000 represents the estimated cost of providing and installing the radio equipment and the provision of Departmental transport. These are the elements about which the Committee did not receive detailed evidence.

CONSTRUCTION TIMETABLE

76. From the date on which instructions to proceed are given, the estimated time for preparing documents, letting a contract and completing the work is approximately 36 months.

SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS

77. The summary of the recommendations and conclusions of the Committee is set out below and alongside each is shown the paragraph to which it refers. Recommendations appear in bold type.

		Paragraph
(1)	For Radio Australia to become more assertive and less susceptible to interference, it is necessary for the transmitted signal strength to be greatly increased	5
(2)	The establishment of a booster station at Darwin will provide the best means of giving the added signal strength necessary to provide good radio reception for Radio Australia audiences in South East Asia	9
(3)	The area chosen for the development of the booster station for Radio Australia is most suitable	15

		Paragraph
(4)	THE CRITERIA USED IN THIS CASE SHOULD BE REVIEWED TO ESTABLISH WHETHER THE EXCLUSION OF SOME ELEMENTS OF THE PROPOSAL FROM REFERENCE TO THE COMMITTEE CAN BE DEFENDED	24, 25
(5)	CONSTRUCTION OF THE VARIOUS BUILDINGS AS PROPOSED IS RECOMMENDED	36
(6)	ROAD CONSTRUCTION AS PROPOSED IS RECOMMENDED	39
(7)	THE COMMITTEE RECOMMEND THE USE OF TRANSMITTED ELECTRIC POWER FROM THE DARWIN POWER HOUSE BY MEANS OF A SUBMARINE CABLE ACROSS DARWIN HARBOUR	48
(8)	THE PROVISION OF MECHANICAL AND ELECTRICAL ENGINEERING SERVICES AS PROPOSED IS RECOMMENDED BUT WITH THE ADDITION OF WINDOW AIR-CONDITIONING UNITS IN THE OFFICES AT THE POWER HOUSE AND THE VEHICLE SHELTER AND IN THE LUNCH ROOM AT THE JETTY BUILDING AT AN ESTIMATED ADDITIONAL COST OF £1,000	54
(9)	STAFF SHOULD BE ACCOMMODATED IN DARWIN RATHER THAN ON COX PENINSULA, PENDING THE RESIDENTIAL DEVELOPMENT OF THE LATTER	67
(10)	IN ORDER TO TAKE ADVANTAGE OF POSSIBLE CO-ORDINATION AND DUAL USE OF SERVICES, ALL THE AUTHORITIES INVOLVED SHOULD CONFER AS SOON AS POSSIBLE TO DETERMINE WHETHER COX PENINSULA IS TO BE DEVELOPED FOR RESIDENTIAL PURPOSES	73, 74
(11)	The estimated cost of the detailed work referred in evidence to the Committee is £1,533,000. Other elements are estimated to cost £1,171,000.	78

R.L. Dean

(R.L. Dean)
Chairman.

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15th September, 1964.