



**NATURAL
RESOURCES AND
ENVIRONMENT
COMMITTEE**

First Report on Inquiry into Transmission Lines Serving Melbourne

June 1983

PARLIAMENT OF VICTORIA

NATURAL RESOURCES AND ENVIRONMENT COMMITTEE

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

FIRST REPORT

STATE ELECTRICITY COMMISSION PROPOSAL

FOR A

500 000 VOLT TRANSMISSION LINE

FROM COLDSTREAM TO SOUTH MORANG

Ordered to be Printed

D-No. 13/1982-83

EXTRACTED FROM THE MINUTES OF THE PROCEEDINGS OF THE
LEGISLATIVE COUNCIL

FRIDAY 2 JULY 1982

- 34 JOINT INVESTIGATORY COMMITTEES--The Honourable W.A. Landeryou moved, by leave, That, contingent upon the enactment and coming into operation, this Session, of legislation to establish Joint Investigatory Committees:

* * *

- (c) The Honourables W.R. Baxter, D.E. Henshaw, R.I. Knowles, B.A. Murphy and B.T. Pullen be members of the Natural Resources and Environment Committee;

Question--put and resolved in the affirmative.

EXTRACTED FROM THE VOTES AND PROCEEDINGS OF THE
LEGISLATIVE ASSEMBLY

THURSDAY 1 JULY 1982

- 36 COMMITTEE APPOINTMENTS--Motion made, by leave, and question-- That, contingent upon the coming into operation of the Parliamentary Committees (Joint Investigatory Committees) Act 1982--

* * *

- (c) Mr Ihlein, Mr McDonald, Mr McGrath, Mr McKellar, Mr Reynolds, Mr Tanner and Dr Vaughan be appointed members of the Natural Resources and Environment Committee.

--(Mr Fordham)--put and agreed to.

WEDNESDAY 23 MARCH 1983

- 6 NATURAL RESOURCES AND ENVIRONMENT COMMITTEE--Motion made, by leave, and question--That Mr Reynolds be discharged from attendance on the Natural Resources and Environment Committee and Mr Burgin be appointed in his stead (Mr Fordham)--put and agreed to.

TERMS OF REFERENCE
PARLIAMENTARY COMMITTEES ACT 1968

4C. The functions of the Natural Resources and Environment Committee shall be to inquire into, consider and report to the Parliament on--

- (a) any proposal, matter or thing concerned with the natural resources of the State;
- (b) how the natural resources of the State may be conserved;
- (c) any proposal, matter or thing concerned with the environment;
- (d) how the quality of the environment may be protected and improved; and
- (e) any works or proposed works reasonably capable of having significant effect upon the resources of the State or the environment--

Where the Committee is required or permitted so to do by or under this Act.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The Need for Reinforcing Transmission to the 500 000 Volt Terminal Stations in the Outer Metropolitan Area

Para 2.35 The Committee concludes that the transmission capacity between the Latrobe Valley and the outer metropolitan area must be adequate to transmit all the additional available export energy from the new power generating plant being constructed in the Latrobe Valley. Otherwise, it will not be possible to fully utilise this more efficient generating plant to:

- (i) Optimise the operating costs of the electricity supply system;
- (ii) Compensate for any short term failure of other sources of power supply such as the Newport Power Station, the Snowy River Hydro Electric Scheme or Victorian Hydro Generation; and
- (iii) Meet any increase in demand that may occur.

Para 2.36 The Committee recommends that:

The fourth 500 000 volt transmission line between the Latrobe Valley and the Melbourne Metropolitan Area should be constructed and in service by the time the third Loy Yang generating unit becomes operational.

Alternatives for Effecting Transmission Reinforcement to the 500 000 Volt Terminal Stations in the Outer Metropolitan Area

Para 3.45 The Committee concludes that:

- (i) The arrangements proposed by the SEC for routing and terminating of the fourth 500 000 volt transmission line from the Latrobe Valley to the outer Melbourne Metropolitan Area, (including the reconnection of existing transmission lines) would appear on balance to be the most favourable of the alternatives for reasons of cost, security of supply to the outer metropolitan area and potential environmental impact;
- (ii) The undergrounding of part or all of this transmission line cannot be economically justified; and
- (iii) As the effects of radiation associated with electrical fields were adequately addressed in the Portland Transmission Line Inquiry this aspect does not require further reporting or investigation at this time.

Para 3.46 The Committee recommends that:

- (i) The feasible route to be subjected to detailed examination of environmental issues should be that proposed by the SEC running along the same easement as the existing line from Hazelwood to South Morang between Coldstream and South Morang (route LV1).
- (ii) The Environment Effects Statement to be prepared on the proposed Coldstream to South Morang line at the request of the Minister for Conservation should examine in detail the environmental effects of the SEC proposed Coldstream to South Morang 500 000 volt transmission line. The Statement should also examine in principle only, the relative environmental impact of alternative transmission lines discussed in this Report.

Alternative Processes for Obtaining Planning Approval to Construct the Line from Coldstream to South Morang

Para 4.25 The Committee concludes that:

- (i) The normal planning approval processes would be unnecessarily complex and lengthy in the case of the proposed Coldstream to South Morang Transmission Line.
- (ii) The most appropriate procedure in this case, if and when, it has been determined that it is appropriate for a transmission line to follow the proposed route between Coldstream and South Morang, would be for the Minister for Planning to request the Governor in Council to exempt the line from planning controls under section 35(d) of the Town and Country Planning Act 1961. This request would follow the preparation of an Environment Effects Statement by the SEC and the holding of a public inquiry by an independent panel appointed by the Minister for Conservation under section 9 of the Environment Effects Act 1978.
- (iii) In view of the sensitive areas through which the proposed transmission line may pass it may be important that conditions be applied to the process of construction of the transmission line along the route eventually selected. These conditions could take the form of conditions upon which the Governor in Council agrees to exempt the transmission line from planning control or could be agreed between the Minister for Planning and the Minister for Minerals and Energy as a condition of the Minister for Planning applying to the Governor in Council for exemption of the transmission line from planning controls.

- (iv) It is unlikely that the Upper Yarra Valley and Dandenong Ranges Regional Strategy Plan will require any amendment to allow the transmission line to be constructed along the existing easement as the proposed inquiry procedure falls within the general intent of procedures set out in the Regional Strategy Plan for approval of major utility installations.
- (v) The Melbourne Metropolitan Planning Scheme falls under the ambit of the Town and Country Planning Act 1961 and use of section 35(d) of this Act would exempt the transmission line from the requirements of the Melbourne Metropolitan Planning Scheme.

Para 4.26

The Committee recommends that:

- (i) An Environment Effects Statement (EES) should be prepared by the State Electricity Commission;
- (ii) The EES should be advertised and made available to the general public and in particular to landholders along the route of the proposed line. The advertisement should make clear the approval procedure which will be followed;
- (iii) The Minister for Conservation should appoint an independent panel in accordance with section 9 of the Environment Effects Act 1978, and should consider limiting the terms of reference of this panel so that matters already examined in this Report are not unnecessarily re-examined. The panel should be asked to recommend to the Minister for Planning whether or not the proposed line should be approved, and if so, what conditions, if any, should be applied to the construction of the line;
- (iv) On receipt of the independent panel's recommendations the Minister for Conservation should make his assessment as required by the Environment Effects Act 1978 and provide it to the Minister for Planning;
- (v) Having received the Minister for Conservation's assessment, and providing that approval of the proposed line has been recommended by the independent panel and agreed to by the Minister for Planning, the Minister should seek the formal agreement of the Minister for Minerals and Energy and the State Electricity Commission, that the Commission will abide by conditions to be applied to the construction of the line as specified by him; and

- (vi) If such an agreement is obtained the Minister for Planning should apply to the Governor in Council for the construction of the transmission line to be exempt from planning control under section 35(d) of the Town and Country Planning Act 1961.

The Natural Resources and Environment Committee, appointed pursuant to the provisions of the Parliamentary Committees Act 1968 (No. 7727) has the honour to report as follows:

INQUIRY INTO TRANSMISSION LINES SERVING MELBOURNE

CHAPTER ONE

INTRODUCTION

1.1 TERMS OF REFERENCE

On 26 October 1982 the Committee was directed by His Excellency the Governor in Council:

"To consider, make recommendations and make a final report to Parliament before 31 March 1983 on -

- 1 the forward planning needs for the development of the State Electricity Commission of Victoria transmission system servicing the metropolitan area;
- 2 the criteria to be adopted in locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in part or in full in the light of land use, economic and environmental constraints; and
- 3 the processes for assessment and approval of power lines to minimise duplication of permits and maximise public input."

1.2 On 23 March 1983, following a request by the Committee for an extension of time to fully examine all of the matters addressed by the three Terms of Reference, the Minister for Minerals and Energy requested the Committee to report progressively in accordance with the following:

(a) By May 1983

Report on the SEC's proposal for a 500 000 volt transmission line from Coldstream to South Morang, addressing -

- . under the first term of reference, the need for reinforcing transmission to the 500 000 volt terminal stations in the outer metropolitan area;
- . under the second term of reference, the feasible route to be subjected to detailed examination of environmental issues;
- . under the third term of reference, the recommended processes for assessment and approval of the route in this instance.

(b) By July 1983

Report on the SEC's proposals for interconnecting 220 000 volt transmission lines between terminal stations at Richmond and Brunswick via Clifton Hill and between Fishermen's Bend and Newport, addressing -

- . under the first term of reference, the needs for the development of the transmission system serving the central business district and the inner metropolitan area;
- . under the second term of reference, the feasible options and alternative routes to be subjected to detailed examination of environmental aspects;
- . under the third term of reference, the recommended processes to be adopted for the assessment and approval of routes in this instance.

(c) By March 1984

Report in relation to future transmission requirements generally, addressing -

- . under the second term of reference, the general criteria for locating terminal stations, assessing alternative routes and the need for undergrounding transmission lines in the light of land use, economic and environmental constraints;
- . under the third term of reference, the processes for assessment and approval of future power lines to minimise duplication of permits and maximise public input.

1.3 On 29 March 1983, His Excellency the Governor in Council ordered that the Committee make its final Report to Parliament before 31 March 1984.

PURPOSE OF THIS REPORT

1.4 This report specifically addresses the SEC's proposal for a 500 000 volt transmission line from Coldstream to South Morang and in particular:

- (i) The need for reinforcing transmission to the 500 000 volt terminal stations in the outer metropolitan area;
- (ii) The feasible route to be subjected to detailed examination of environmental issues; and
- (iii) The recommended process for assessment and approval of the route in this instance.

The Committee has received many submissions which relate both to this proposal and to the Committee's overall Terms of Reference.

The Committee took these into account in arriving at the recommendations contained in this Report. However detailed discussion of the broader aspects of those submissions particularly with respect to the processes for assessment and approval has been omitted from this Report and will be contained in the Committee's final Report.

PROCEDURE FOLLOWED BY THE COMMITTEE

- 1.5 Following the Order in Council of 26 October 1982, the Committee advertised the Terms of Reference in the national press on 22 November 1982 and called for submissions to be made to the Committee by 4 February 1983.
- 1.6 Public hearings were held at Parliament House on 1 and 8 December 1982 at which the State Electricity Commission presented its submission and initial evidence.
- 1.7 On 9 February 1983, the Committee inspected the routes of the transmission lines and terminal station sites proposed by the SEC in their earlier submissions. Representatives of local municipalities were present on those inspections.
- 1.8 In March 1983 the SEC produced a document entitled "State Electricity Commission Proposal for a 500 000 volt Transmission Line Coldstream to South Morang - March 1983". By agreement with the Committee this document was circulated to all municipalities along the route of the proposed line and to individuals and groups who had made earlier submissions to the Committee on this particular topic.
- 1.9 The SEC then held exploratory discussions with these municipalities, individuals and groups during March and April.
- 1.10 On 26 April a further public hearing was held at Parliament House to receive evidence relating only to its Terms of Reference dealing with the proposed Coldstream to South Morang 500 000 volt transmission line. This hearing was advertised in the Victorian press on 21 April and all those who had made submissions on this topic were notified.

- 1.11 At this hearing the SEC formally presented to the Committee its document entitled "State Electricity Commission Proposal for a 500 000 volt Transmission Line Coldstream to South Morang - March 1983", and presented some additional evidence answering some of the questions which had been raised during the exploratory discussions previously mentioned.
- 1.12 Evidence was also taken at this hearing from all other interested parties who wished to make a verbal submission at this time on the Coldstream to South Morang Line.
- 1.13 This Report now proceeds to address in turn each of the Terms of Reference relating to the proposed Coldstream to South Morang 500 000 volt transmission line.
- 1.14 Appended to this Report are:
- (i) A list of submissions received⁽¹⁾ (Appendix 5);
 - (ii) A list of witnesses (Appendix 6); and
 - (iii) Minutes of Evidence⁽¹⁾.

(1) Minutes of Evidence and Submissions not printed

CHAPTER TWO

THE NEED FOR REINFORCING TRANSMISSION TO THE 500 000 VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

THE CASE PUT FORWARD BY THE STATE ELECTRICITY COMMISSION

The existing Latrobe Valley to Melbourne transmission system

- 2.1 The existing transmission connection to Melbourne from the Latrobe Valley consists of three single circuit 500 000 volt lines, terminating at South Morang Terminal Station (SMTS) to the north of Melbourne and three double circuit 220 000 volt lines terminating at Rowville Terminal Station to the east, as illustrated in Figure 2.1.
- 2.2 This transmission, connecting as it does to the Latrobe Valley brown coal generation, provides access to 4 200 MW of plant supplying some 82% of the energy generated annually for the entire State system. The average annual output of Latrobe Valley power generation is presently some 60% of its installed capacity, although for much of the year the output is in excess of 75% of installed capacity and can range up to about 85%. Higher average output is expected in future years with full service of the modern units at Yallourn W and Loy Yang and the reconditioning of Hazelwood.

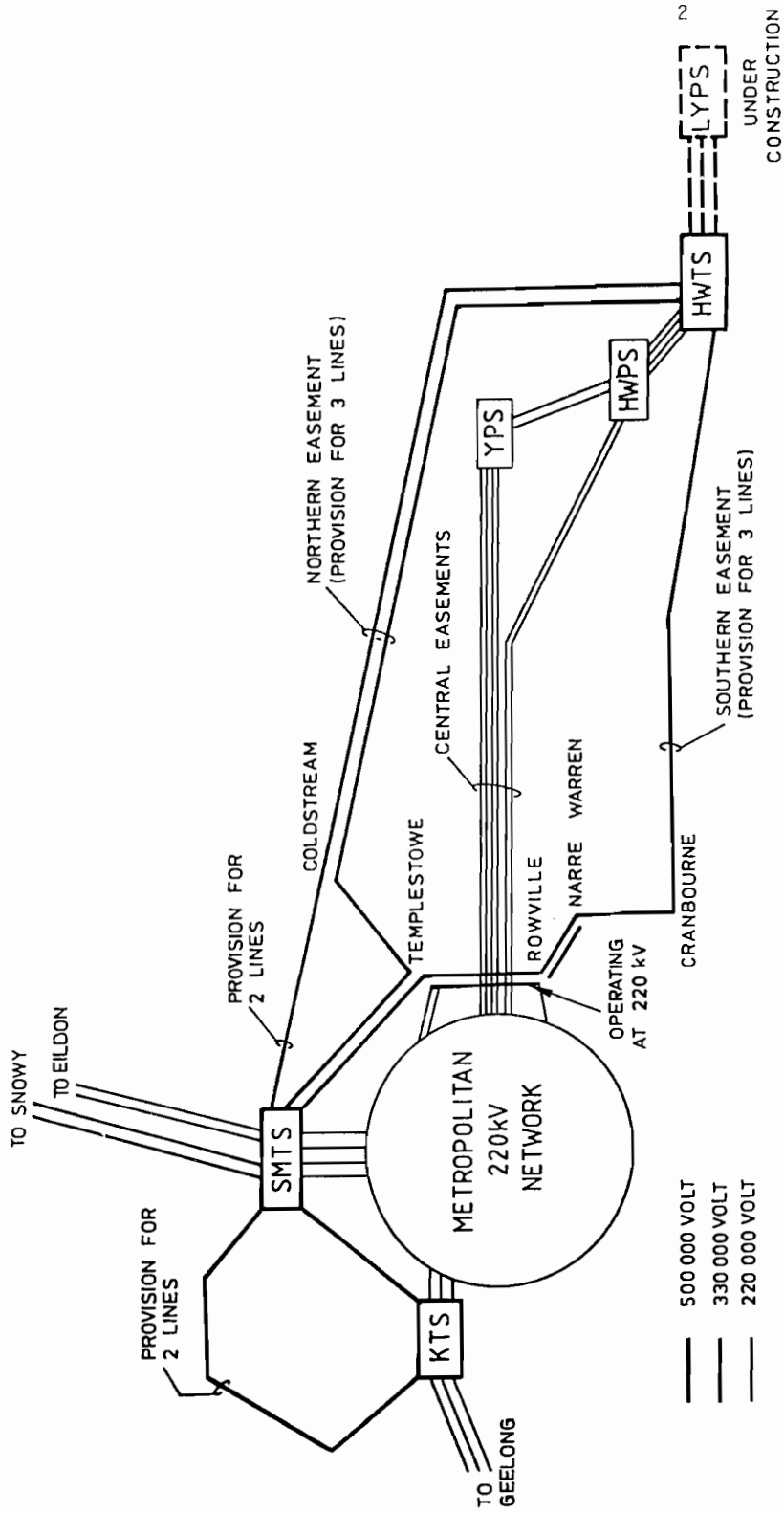


FIG 2.1
LATROBE VALLEY TO MELBOURNE TRANSMISSION - EXISTING

- 2.3 The net power export from the Latrobe Valley to Melbourne and the west of the state is maintained at a consistently high level throughout the year ranging up to approximately 80% of the Latrobe Valley installed generating capacity. The transmission system from the Latrobe Valley to Melbourne must have the capability to accept this, if excessive dependence on less economic generation or the drawdown of limited hydro reserve is to be avoided.
- 2.4 At present, this transfer capability is some 4700 MW, determined largely by stability considerations. Operation beyond this limit could result in widespread interruption to supply and possible system shutdown, following a line short circuit. The 4700 MW transfer capability is sufficient to permit access to the maximum available generation export level presently attainable from the existing Latrobe Valley power stations (i.e. Latrobe Valley generation less power station auxiliary and open cut supplies and supply to Gippsland).

Latrobe Valley generation expansion
to meet forecast growth

- 2.5 The SEC's planning for expansion of the State generating system is based upon long-term load forecasts which are regularly reviewed and represent the latest estimate of growth expected in the classes of electricity sales (ie. domestic, commercial and industrial).
- 2.6 The most recent forecast was presented in the "1982-1997 Long-term Electricity Forecasts", published by the SEC in early 1983.
- 2.7 This document shows the projection of demand and energy requirements of the generation for the range of future loads which have a reasonable probability of occurrence, given the uncertainty of present outlooks. However, for planning purposes, a base scenario has been chosen, about which the SEC is developing flexible plans.

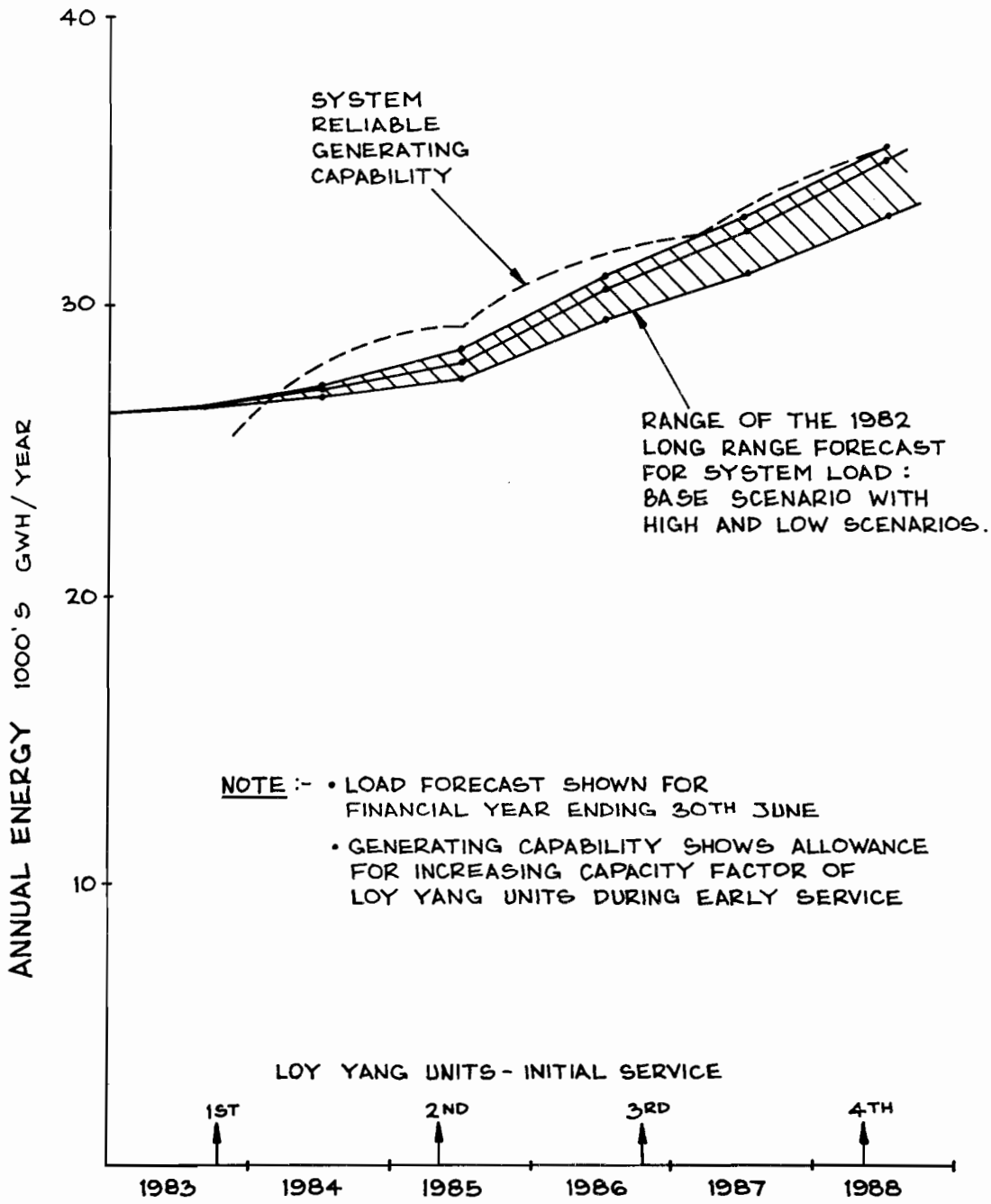


FIGURE 2.2 LOAD AND GENERATION FORECAST

- 2.8 To reliably meet this base scenario, generating units of the Loy Yang A Power Station project have been programmed at about 18 month intervals with the first unit scheduled for initial operation in October 1983. Figure 2.2 shows a comparison of the load forecast with the reliable energy generating capability of the Victorian system, with Loy Yang A units scheduled for initial operation in October 1983, May 1985, November 1986 and May 1988.
- 2.9 With the introduction of Loy Yang units to the above program, the installed generating capacity in the Latrobe Valley over the period to 1987/88 will increase from some 4 200 MW to 6 200 MW and, as illustrated on Figure 2.3, the maximum probable Latrobe Valley generation export level to Melbourne and to the west increases from the present level of about 3 300 MW to about 5 100 MW by 1987/88.

Power transfer capability of the Latrobe Valley
to the Melbourne transmission system and the
need for reinforcement

- 2.10 The power transfer capability of the present three 500 000 volt line and the three double circuit 220 000 volt lines from the Latrobe Valley to Melbourne, as mentioned previously and indicated on Figure 2.3, is 4700 MW determined by the requirement for the system to remain intact and capable of supplying system load following failure of a transmission line. During hot summer periods, the capability would be reduced to 4300 MW because of thermal limits on the older 220 000 volt transmission lines.
- 2.11 Thus, the generation to be exported from the Latrobe Valley with Loy Yang A Power Station in full service (5 100 MW) will considerably exceed the transfer capability of the existing transmission system (4 700 MW). Even during summer the reduced generation export of 4 600 MW will exceed the summer capability of the existing transmission system.

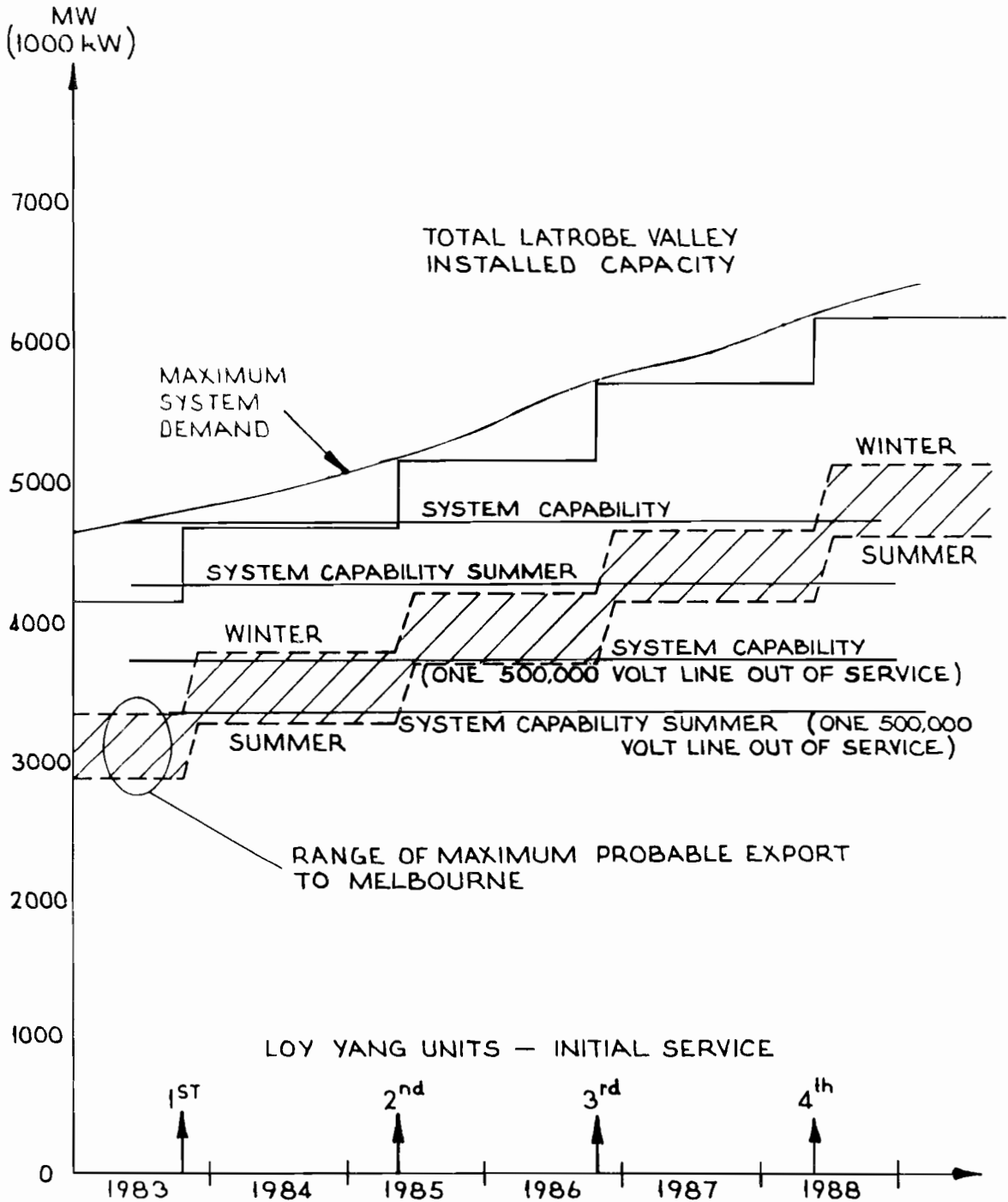


FIG.2.3 LATROBE VALLEY TO MELBOURNE TRANSMISSION SYSTEM CAPABILITY

- 2.12 It is quite evident therefore, that growth of generation in the Latrobe Valley will inevitably require reinforcement of the existing Latrobe Valley to Melbourne transmission system and it must be available before full output of Loy Yang A Power Station is obtained.
- 2.13 The transmission for the Latrobe Valley has been developed with 500 000 volt lines, each of which can transfer about 1 000 MW in normal service. This capability is appropriate to the successive installation of large generating units in the Latrobe Valley. It is logical therefore, with a large development such as the 4 000 MW Loy Yang project (A and B Power Stations) in progress, that the transmission be reinforced by a fourth 500 000 volt transmission line.
- 2.14 The termination of the fourth 500 000 volt transmission line requires reinforcement of the outer metropolitan transmission system.

Timing of the fourth 500 000 volt transmission line
and its termination in the metropolitan area

- 2.15 It can be seen from Figure 2.3 that the maximum probable generation exported from the Latrobe Valley will reach the capability of the existing transmission system with service of the third Loy Yang generator.
- 2.16 However, during construction of the fourth 500 000 volt transmission line, there will be extensive periods during which existing 500 000 volt lines will have to be taken out of service for reconnection. During these periods, as can be seen in Figure 2.3 (one line out-of-service condition), the transmission capability will be impaired by as much as 1 000 MW. Therefore, to avoid severe curtailment of the Latrobe Valley generation and its replacement by high cost generation elsewhere, and to allow construction to be organised with reasonable flexibility, the reinforcement needs to be completed prior to initial operation of the third Loy Yang generator presently planned for November 1986.

- 2.17 The program planned by the SEC for the approval processes, design, and construction of the proposed Coldstream to South Morang 500 000 volt transmission line follows as Figure 2.4. The program planned for sections of the fourth 500 000 volt transmission between Hazelwood, Cranbourne and Narre Warren follows as Figure 2.5.

Role of the Coldstream Terminal Station

- 2.18 Characteristics of terminal stations:

The SEC use the term "terminal station" for all stations terminating transmission lines. The stations serve two distinct roles -

- (i) Main Transmission Terminal Stations which receive bulk power from generating points and supply other load terminal stations.

In the metropolitan area, the stations of this type are -

- . Keilor in the west;
- . South Morang in the north;
- . Rowville in the east.

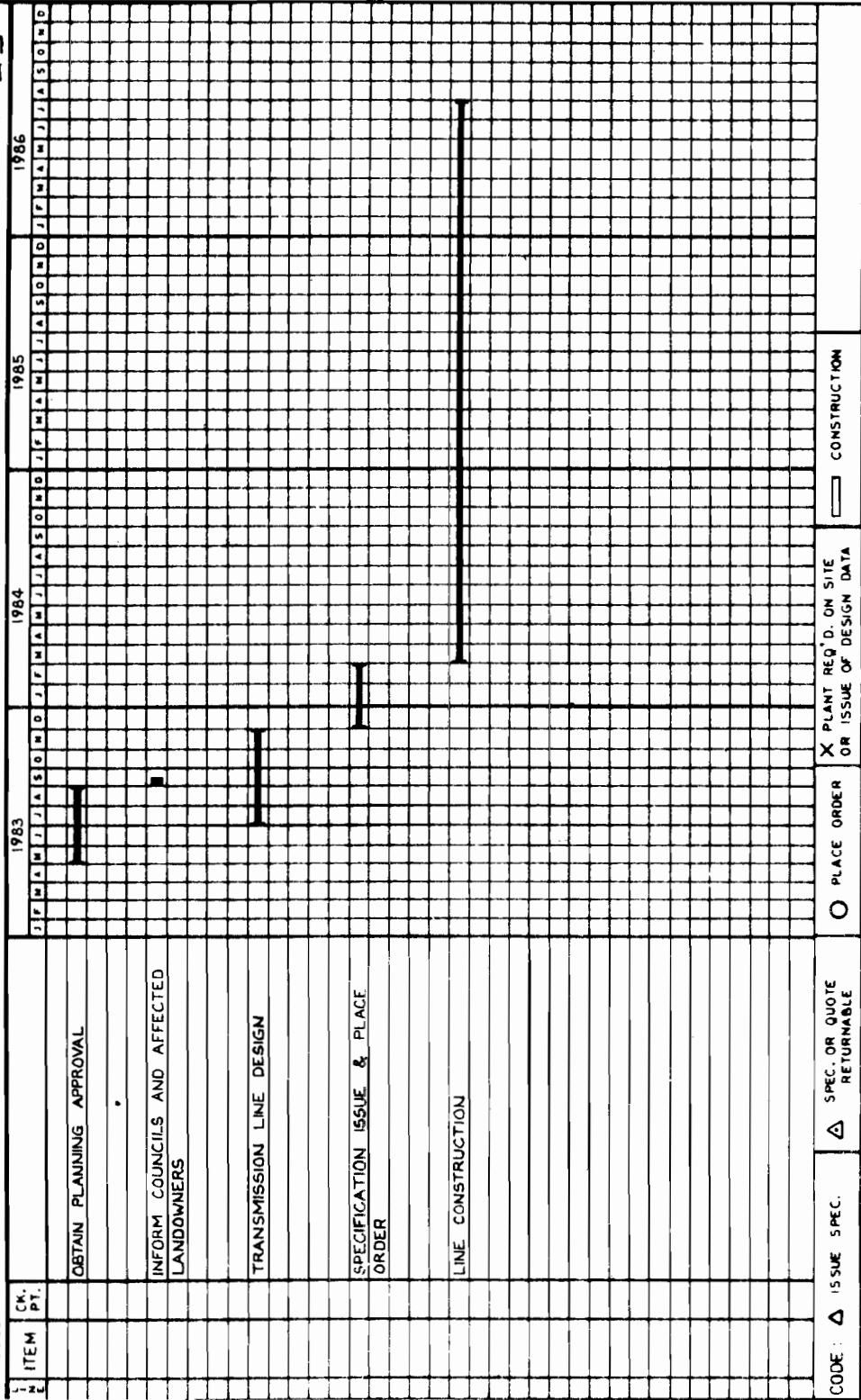
- (ii) Load Terminal Stations which provide supply to the 66 000 volt subtransmission network.

- 2.19 To supply the 66 000 volt subtransmission network from the 220 000 volt transmission lines, the twelve stations mentioned in Section I of the SEC Submission to the Committee in November 1982 are of this type. Their characteristics are detailed in Section 4 of that Submission.

- 2.20 Two of the existing 500 000 volt transmission lines from the Latrobe Valley to South Morang are routed via the site reserved for a future Coldstream Terminal Station - refer Figure 2.6. This station has been

PROGRAM FOR 500KV HAZELWOOD - CRANBOURNE - NARREWARREN (ON EXISTING ROUTE) **FIGURE 2.5**

PROJECT



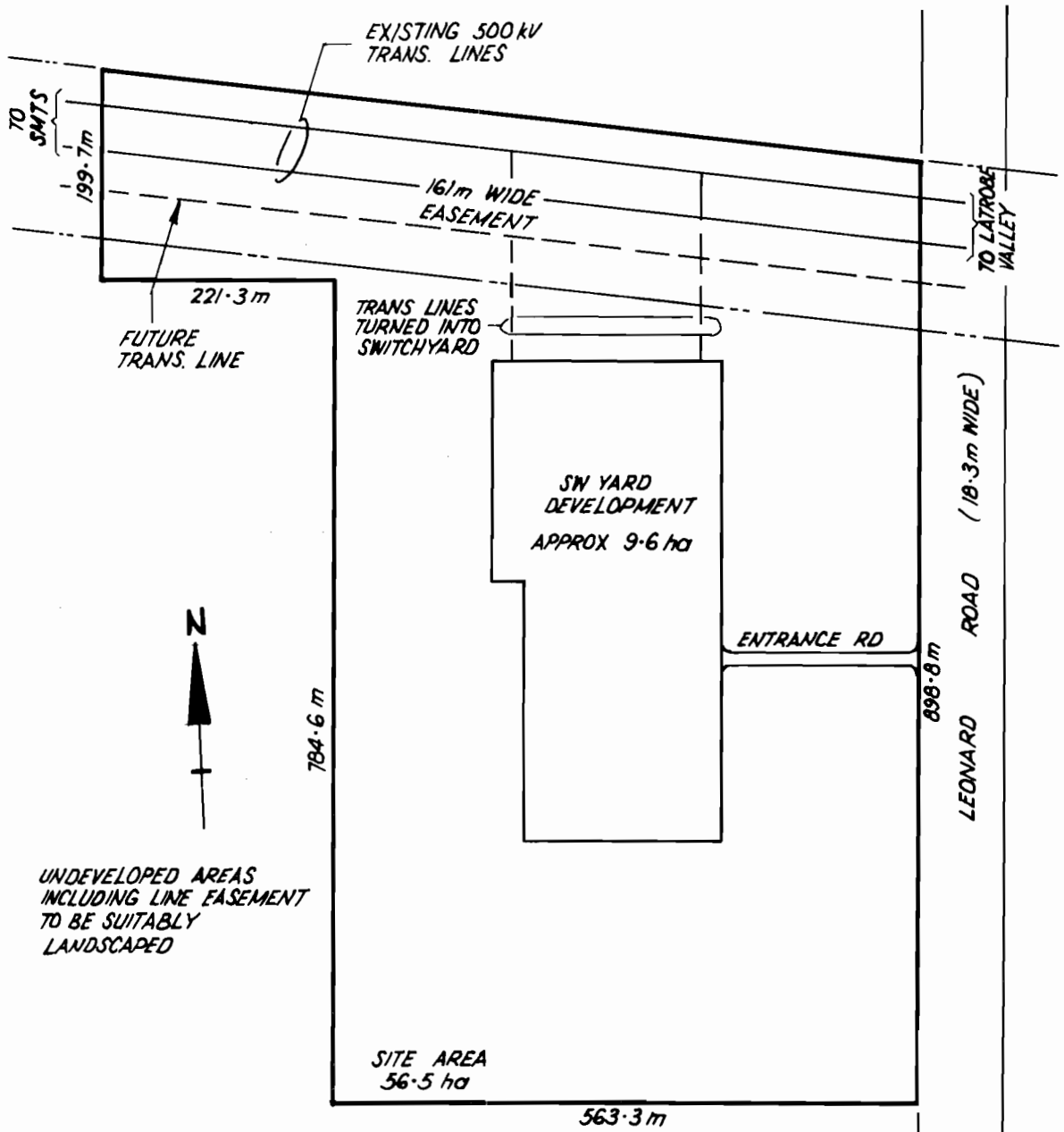
planned to act as a termination of the 500 000 volt transmission lines from the Latrobe Valley and for development beyond the fourth 500 000 volt transmission line, of which the proposed Coldstream to South Morang transmission line forms a section; that is, Coldstream is of the first type described previously. It would serve ultimately as a direct supply point for the metropolitan 220 000 volt subtransmission system but would not provide supply to the 66 000 volt subtransmission network. Of the total site area of 56.5 Ha, the switchyard and building development would occupy approximately 9.6 Ha.

The remaining area, including the easement, will be landscaped.

SUBMISSIONS BY PARTIES OTHER THAN THE SEC IN RELATION
TO THE NEED FOR REINFORCING TRANSMISSION TO THE 500 000
VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

- 2.21 Four submissions were made on the question of need to the Committee. The first submission was specifically related to the need for the Coldstream to South Morang line and was made by a Mr. R.F. English. Mr. English made a written submission and appeared before the Committee on 26 April 1983. Mr. English's written submission was made after he had read the evidence submitted by the SEC on 1 and 8 December 1982. He pointed out that the SEC Submission, in his opinion, provided very little proof of the need for a fourth line to South Morang.
- 2.22 As a result of this submission the SEC addressed the question of need in more detail in their submission of 26 April 1983. During the hearing of evidence from Mr English he requested the opportunity to raise further questions in relation to the SEC's Submission of 26 April. It was agreed that those questions could be raised in writing to the Committee and that the Committee would request the SEC to reply in writing to Mr English. These questions by Mr English and the reply from the SEC are attached to this Report as Appendices 1, 2, 3 & 4.
- 2.23 A submission by the Conservation Council of Victoria made the following points in relation to the question of need:

FIG 2-6



COLDSTREAM TERMINAL STATION
POSSIBLE LAYOUT

SCALE 1:5000

- (i) Steps towards energy efficiency as outlined in the first report of the Australian Conservation Foundation's Sunday Ebbott Energy Project should be initiated immediately; and
- (ii) The resultant reduction in load growth would make further transmission capacity and improved security unnecessary.

2.24 A submission by the Ministry for Conservation indicated that they had not been able to fault the logic presented by the SEC for the forward planning needs of the transmission system supplying the metropolitan area, and recommended that the options put forward by the SEC should be adopted as the basis for further detailed evaluation of the alternative methods of transmission including the preparation of environment effects statements for each of the proposed lines.

2.25 The Merri Yarra Municipal Protection Committee (MYMPC) made the following comments regarding projected load increases.

It referred to Section 1.2 of the SEC Submission in which it is stated that accurate long term forecasts are not realistic. Indeed it has been shown that the Commission's overall forecasts for power requirements in the State have been over-exaggerated. It would seem therefore, that an independent survey of likely load growth within the metropolitan area in general, and the central business district and inner eastern suburbs in particular, should be undertaken to provide an alternative assessment to that already given by the SEC. The MYMPC does not believe that historical methods alone of assessing likely load increases are appropriate in today's rapidly changing social, economic and technical environment. Careful and prudent Government planning action and energy management could have a considerable bearing on the ultimate load growth.

DISCUSSION

2.26 The need for the transmission line and in particular the point in time at which the line should be constructed would normally be dictated in the first instance by forecasts of electricity demand for areas of Victoria away from the Latrobe Valley and Gippsland.

- 2.27 Because of the uncertainty which currently exists about the future economic environment, the SEC has produced electricity demand forecasts which indicate a range of possible requirements. These forecasts were prepared late in 1982 and are to some extent already out of date as the degree of economic certainty has not improved during the last six months. The Committee examined this area and concluded that little would be gained in relation to the Committee's Terms of Reference from engaging independent experts to produce alternative load forecasts at this time.
- 2.28 The Government is committed to the construction of the Loy Yang Project and the generating plant at Loy Yang will rank amongst the most efficient and lowest operating cost plants within the SEC system. As a consequence, there will be considerable advantage in operating this Station and using power from this source in preference to power from the gas-fired Newort and Jeeralang Power Stations or from the old standby equipment in the metropolitan area irrespective of any increase in load demand. In addition there will be situations where the hydro-generation capacity will either be unavailable or need to be conserved because of shortages of water. In this situation it will be necessary to maximise the input to the system from the Latrobe Valley.
- 2.29 The SEC has indicated that the principle upon which they operate the transmission system is that for the probable range of generation conditions, the system must be able to remain stable and supply the electricity demand if one transmission line between the Latrobe Valley and Melbourne is lost due to a fault. In addition the system is designed to remain stable for overage generating conditions following loss of a line when another line is out of service for maintenance purposes (including the repair of earlier fault conditions). The Committee agree that this is a sound operating principle.
- 2.30 The SEC has also indicated that construction of the proposed transmission line involves taking existing transmission lines out of service for certain periods so that they can be reconnected into new sections of transmission line. (see 2.16)

- 2.31 The SEC point out that it would be desirable to start the installation of the new line well in advance of the initial operating date for the third Loy Yang generator (currently proposed for May 1986) so as to minimise the risks to the stability of the supply system during the construction period. The Committee also agrees that this is a reasonable precaution to take.
- 2.32 If the load demand should increase at the rate predicted by the SEC or at a higher rate, and the fourth transmission line is not in service when the third Loy Yang generator comes into service, it will not be possible to fully utilise the installed capacity at Loy Yang. It will also become progressively more difficult to take lines out of service to install the fourth line as the load increases.
- 2.33 The Committee note that the information put forward by the SEC on the question of transmission capacities between the Latrobe Valley and Melbourne has simplified a very complex problem. A detailed review of the transmission requirements and SEC's evidence would require the assistance of experts over a considerable period of time.
- 2.34 The Committee believes that the SEC's case is fairly self evident on this occasion and that it would be more appropriate for a detailed review of the transmission system between Latrobe Valley and Melbourne to be conducted when the foreshadowed fifth transmission line is being considered, as many additional factors will need to be considered at that time including the Coldstream Terminal Station. It is estimated currently that this fifth line would be required in service by about 1990; detailed consideration of the factors involved should therefore occur in about 1985. The need for a review will be discussed more fully in the Committee's final Report on the overall Terms of Reference due to be presented to Parliament by 31 March 1984.

CONCLUSIONS

- 2.35 The Committee concludes that the transmission capacity between the Latrobe Valley and the outer metropolitan area must be adequate to transmit all the additional available export energy from the new power generating plant being constructed in Latrobe Valley. Otherwise, it will not be possible to fully utilise this more efficient generating plant to:
- (i) Optimise the operating costs of the electricity supply system;
 - (ii) Compensate for any short term failure of other sources of power supply such as the Newport Power Station, the Snowy River Hydro Electric Scheme or Victorian Hydro Generation; and
 - (iii) Meet any increase in demand that may occur.

RECOMMENDATION

- 2.36 The fourth 500 000 volt transmission line between the Latrobe Valley and the Melbourne Metropolitan area should be constructed and in service by the time the third Loy Yang generating unit becomes operational.

CHAPTER THREE

ALTERNATIVES FOR EFFECTING TRANSMISSION REINFORCEMENT TO THE 500 000 VOLT TERMINAL STATIONS IN THE OUTER METROPOLITAN AREA

THE CASE PUT FORWARD BY THE STATE ELECTRICITY COMMISSION

Existing Latrobe Valley to Melbourne transmission and metropolitan termination

- 3.1 The existing transmission system from the Latrobe Valley to the Melbourne metropolitan areas consists of three 220 000 volt double circuit lines and three 500 000 volt single circuit lines as shown in Figure 2.1. The 220 000 volt lines terminate at the Rowville Terminal Station and supply the eastern metropolitan area, whilst the 500 000 volt lines terminate at the South Morang Terminal Station and supply the northern and western metropolitan areas.
- 3.2 Two of the 500 000 volt lines were established in the late 1960s on a northern easement in conjunction with the Hazelwood Power Station and supply the western metropolitan area from the Keilor Terminal Station (KTS). The lines were routed via Coldstream and South Morang with one line being on a direct Coldstream to South Morang easement and the other routed via Templestowe to provide for later development of supply for the north-eastern metropolitan area. The easements from Coldstream to South Morang were each approved with capacity for a second circuit, thereby providing for the four incoming 500 000 volt lines to South Morang.
- 3.3 The third 500 000 volt line was established in late 1982 on a southern easement via Cranbourne, Narre Warren and Templestowe, in

conjunction with commercial service of the completed Yallourn W Power Station and in preparation for service of the initial Loy Yang A units. The planning permission for the section of this line between Hazelwood and Cranbourne included easement provision for two further 500 000 volt lines. The section between Cranbourne and South Morang was established on an existing easement.

Planning for the fourth 500 000 volt line
and its termination in the metropolitan area

- 3.4 The further 500 000 volt line from Hazelwood to Melbourne is planned to be established on the southern 500 000 volt easement adjacent to the existing 500 000 volt line from Hazelwood to Templestowe. The section of the line between Narre Warren and Templestowe has already been constructed and the Rowville to Templestowe part of this section is temporarily in service at 220 000 volts. Figure 3.1 shows the route of the fourth 500 000 volt lines through to Templestowe (the route is dotted). A number of options are available for termination of the fourth 500 000 volt line in the metropolitan area but the SEC's preferred arrangement is to bring all four 500 000 volt circuits from the Latrobe Valley into the South Morang Terminal Station. This has the advantage of avoiding the early development of a third major 500 000 volt terminal station. Segregation of the four circuits to South Morang onto two separate easements provides the required degree of security against total loss of supply from a single event.
- 3.5 To achieve connection of the fourth 500 000 volt transmission line into South Morang, the SEC propose to take the existing second 500 000 volt line (the southern circuit on the northern easement) directly into South Morang from Coldstream, so as to free up the section between Templestowe and South Morang for inclusion as part of the fourth 500 000 volt line. The short section on the northern easement between Templestowe and Coldstream would then be left out-of-service until the future establishment of new 500 000 volt switching stations at Templestowe and Coldstream.

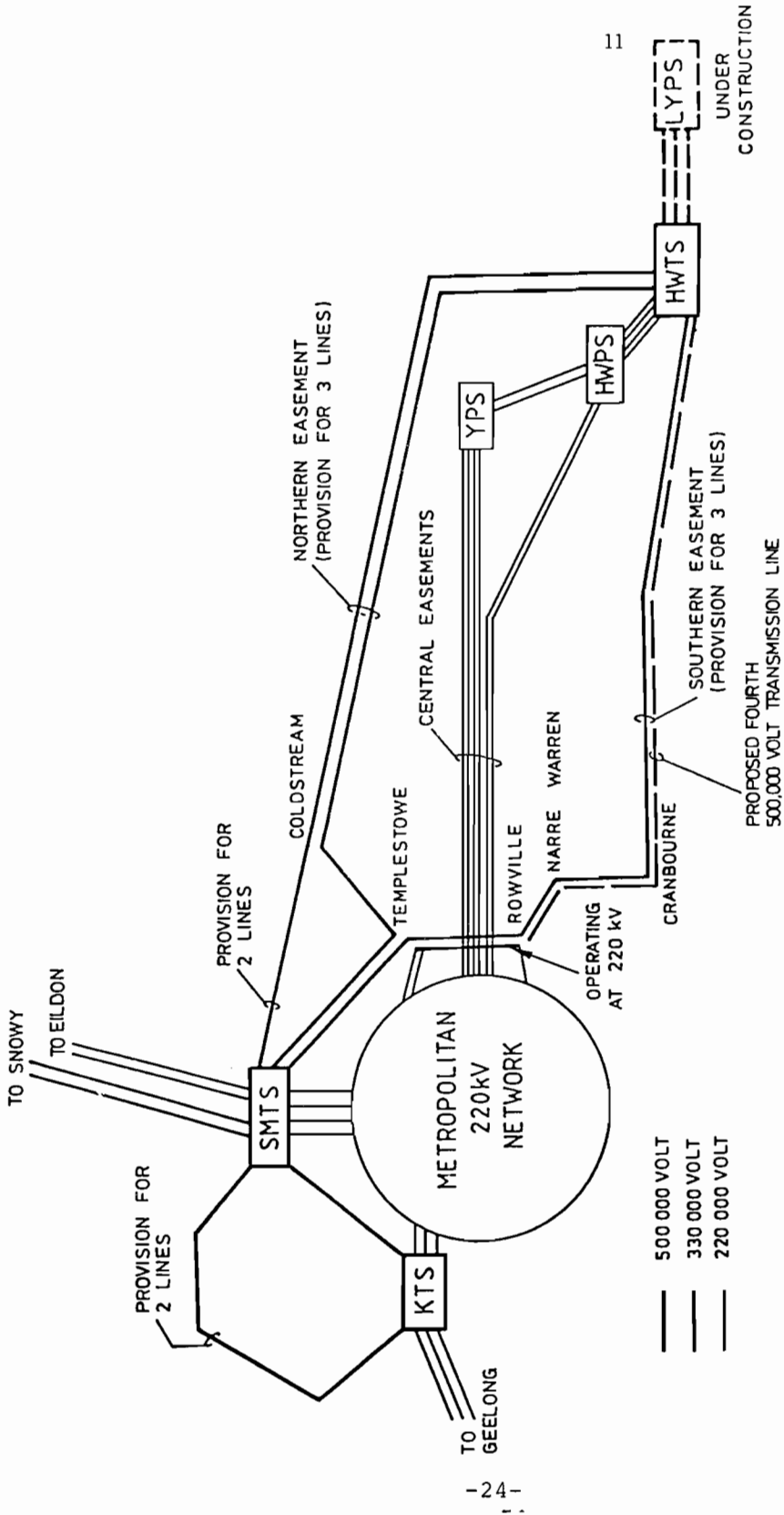


FIG 3-1
LATROBE VALLEY TO MELBOURNE TRANSMISSION - PROPOSED
 (INCLUDING PROPOSED FOURTH 500,000 VOLT TRANSMISSION LINE)
 (LATROBE VALLEY TO MELBOURNE)

- 3.6 Figure 3.2 shows this preferred termination arrangement as option LV1. Two other feasible options, LV2 and LV3, are discussed involving connections to existing terminal stations and this is followed by a discussion of the possibility of developing new terminal stations at Templestowe, Coldstream and Narre Warren as termination points for the fourth transmission line.

SECs preferred option LV1:
Second Coldstream to South Morang line
(Figure 3.2 top right)

- 3.7 This option, which is the SEC's preferred proposal, requires construction of a second single circuit 500 000 volt line of some 26km in length between Coldstream and South Morang on the same easement as the first (northern-most) 500 000 volt line. The second 500 000 volt line would then be connected via this new circuit directly into South Morang.
- 3.8 The capital cost of this line on the existing easement, which is the shortest available route, is estimated to be some \$11 million.

Option LV2: Establish a Coldstream
to Donnybrook line - (Figure 3.2 bottom left)

- 3.9 This option would require a new single circuit 500 000 volt line from Coldstream to Donnybrook, by-passing South Morang, to establish a Hazelwood to Donnybrook line by using one of the existing Hazelwood to Coldstream lines on the northern easement. As for the preferred option LV1, the fourth line would be connected to South Morang using the Templestowe to South Morang line section of the second 500 000 volt line currently routed through Templestowe.
- 3.10 Three circuits would be switched at South Morang and one would be switched at a new terminal station at Donnybrook.

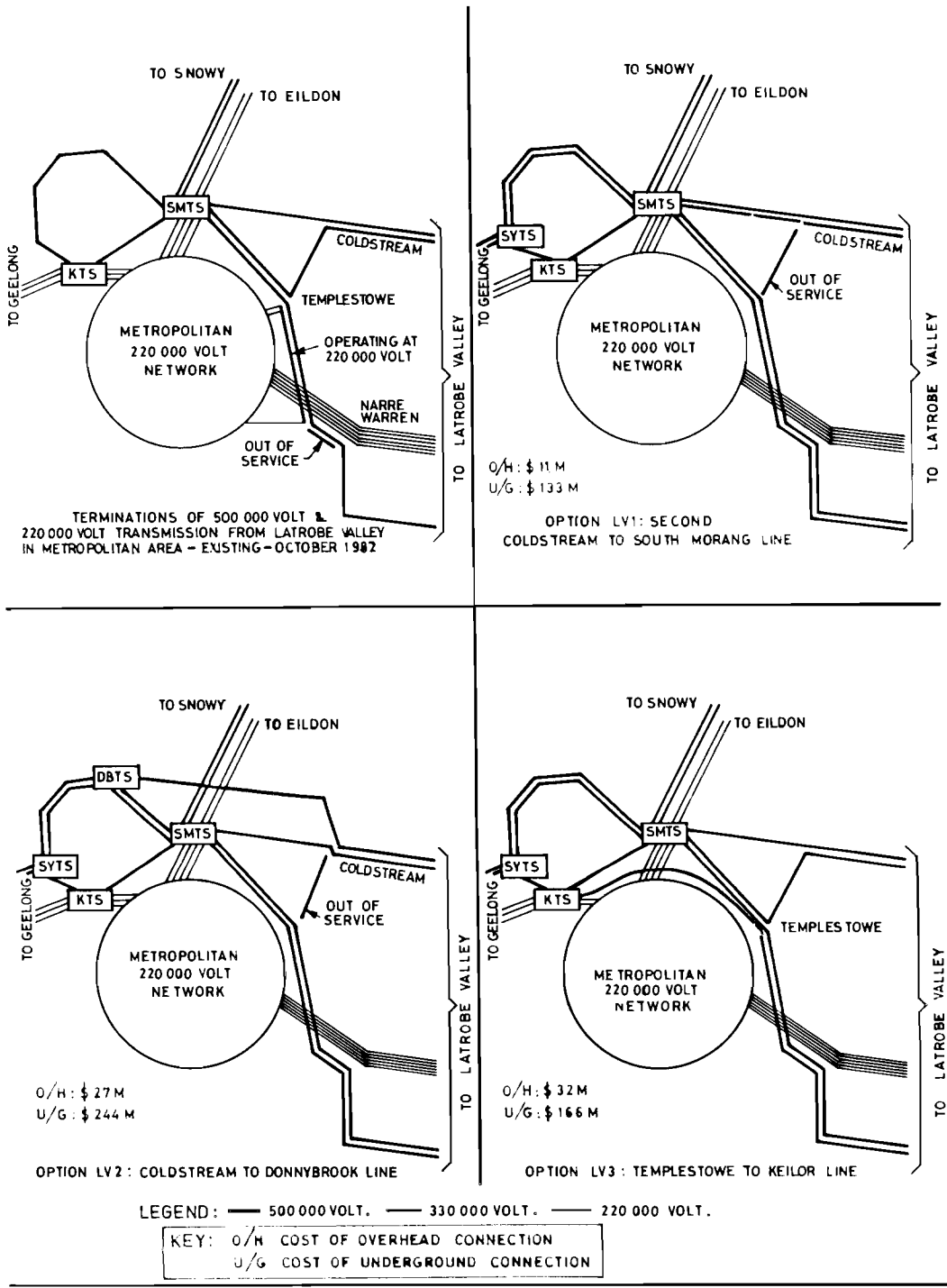
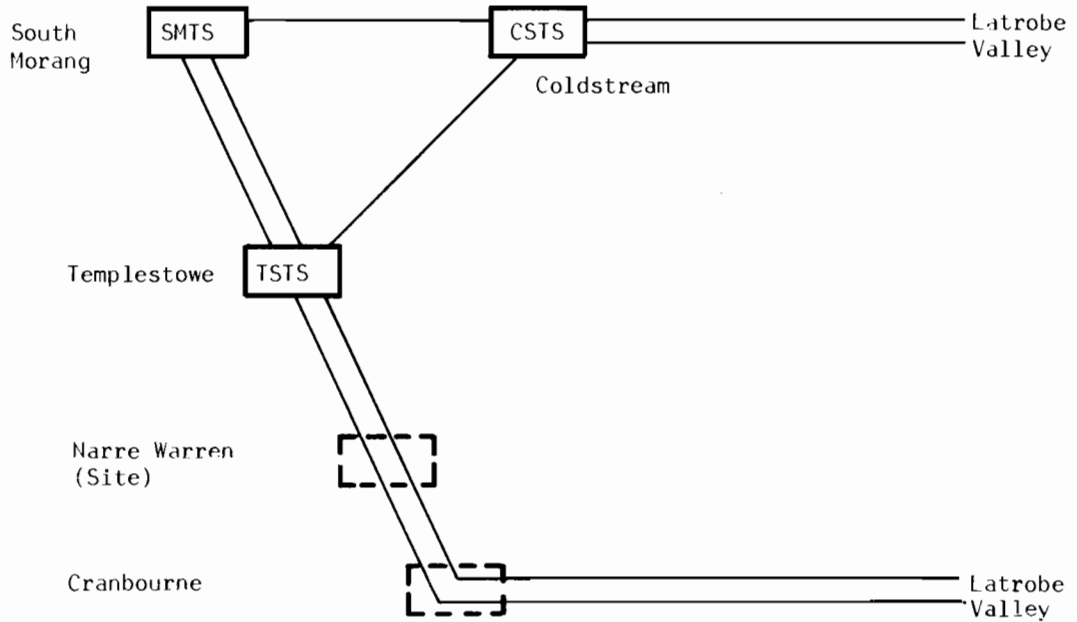


FIG. 3-2
 OPTIONS FOR TERMINATION OF TRANSMISSION
 FROM LATROBE VALLEY IN THE METROPOLITAN AREA

- 3.11 This arrangement has the advantage of diversifying the termination of the four 500 000 volt lines.
- 3.12 On the other hand, because of the greater length involved in this option it would cost some \$18 million and also involve the establishment of a new Donnybrook Terminal Station at an additional cost of \$9 million.
- 3.13 The total cost of the option would therefore be \$27 million. Moreover, the connection from Coldstream to Donnybrook would require a new easement to be taken over a longer route to the north of Melbourne with inevitably more protracted processes for approval and with longer periods being needed for design and construction.

Option LV3: Establish a Templestowe to Keilor line
(Figure 3.2 bottom right)

- 3.14 This option would require a new single circuit 500 000 volt line from Templestowe to Keilor, allowing the fourth 500 000 volt line to be brought directly into the Keilor Terminal Station.
- 3.15 This arrangement (as for option LV2) also has the advantage of diversifying the termination of the four 500 000 volt lines from the Latrobe Valley.
- 3.16 Again, because of the greater length involved in this option compared to the Coldstream to South Morang option, the cost would be some \$17 million for the 500 000 volt line and some \$15 million for reconstruction of the existing 220 000 volt line on the easement. The total cost of the option would therefore be \$32 million. The existing easement over which this Templestowe to Keilor connection would be established is already occupied by two double circuit 220 000 volt lines which would have to be reconstructed to allow introduction of the 500 000 volt line on the easement with attendant impairment of security during the necessary lengthy period the 220 000 volt lines would be out-of-service.



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE
 BY ESTABLISHMENT OF TEMPLESTOWE & COLDSTREAM TERMINAL STATIONS

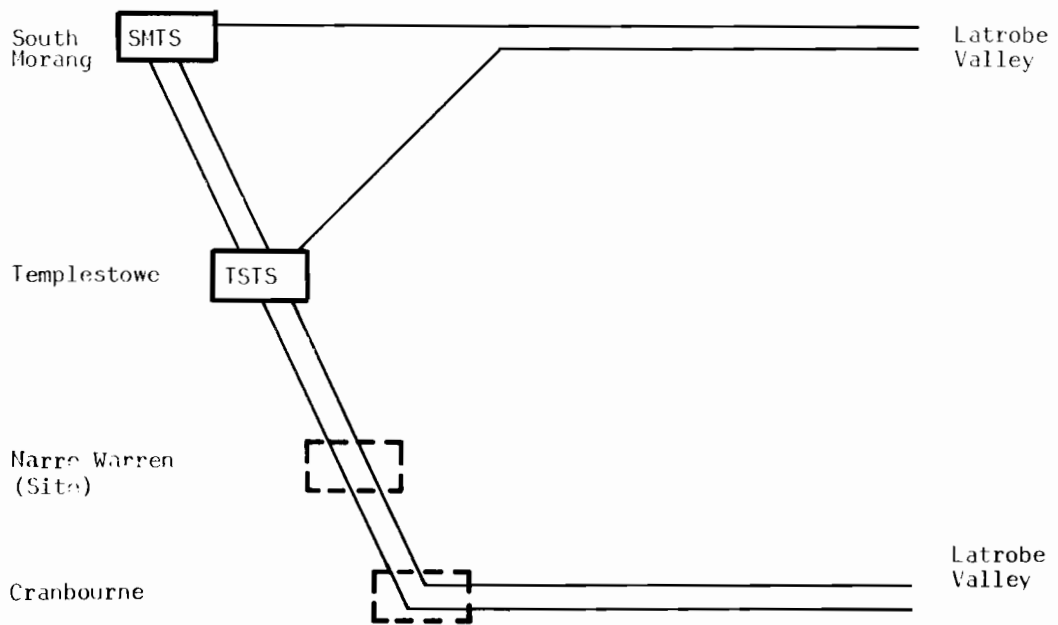
Figure 3.3

Undergrounding

- 3.17 Any of the foregoing options for establishing the fourth 500 000 volt line could be accomplished by underground cable connections.
- 3.18 The SEC estimates the Coldstream to South Morang connection would cost some \$133 million to underground; to underground the Coldstream to Donnybrook line would cost some \$224 million; and undergrounding of the Templestowe to Keilor option would cost around \$166 million. These costs are for minimum rating connections only and to bring the capacity up to the full rating of the equivalent connected overhead lines the SEC estimates that these costs would almost double.

The Development of Templestowe and Coldstream Terminal Stations

- 3.19 It would be possible to establish a terminal station to switch the 500 000 volt lines at Templestowe and the fourth line could be terminated here. Figure 3.3 illustrates the connections. This arrangement has the advantage that it diversifies some switching away from South Morang, but it has a very serious drawback. If one of the lines between Templestowe and South Morang were to be taken out of service for maintenance, failure of the remaining circuit between Templestowe and South Morang would leave three Latrobe Valley 500 000 volt lines disconnected from the metropolitan load centre.
- 3.20 To overcome this problem, it would be necessary to simultaneously develop switching at the Coldstream Terminal Station site. This arrangement as discussed in Section 3.4 of the SEC November 1982 Submission, and shown in Figure 3.4 diversifies switching away from both South Morang and Templestowe. With three short lines into South Morang from Templestowe and Coldstream, loss of any two lines will not result in isolation of Latrobe Valley lines from the load centre. One circuit would remain, a tenuous connection, but nonetheless capable of carrying the load because of its relatively short length.



TERMINATION OF FOURTH 500 000 VOLT
TRANSMISSION LINE AT TEMPLESTOWE

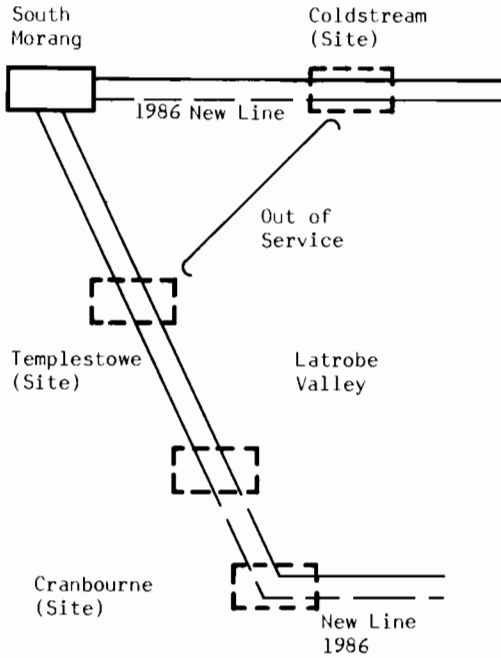
Figure 3.4

- 3.21 With the foregoing terminal station arrangement, which would cost around \$24 million, it would be possible to defer the \$11 million Coldstream to South Morang line by about three to four years to coincide with service of the first Loy Yang B Station unit.
- 3.22 This option can do no more than just delay requirement for the line.
- 3.23 One of the alternatives for later connecting the fifth Latrobe Valley 500 000 volt line to the metropolitan load centre, is to establish Coldstream and Templestowe Terminal Stations and terminate the line at Coldstream. By this time it would be essential to have the second Coldstream to South Morang 500 000 volt line in service. Figure 3.5 illustrates the connections.
- 3.24 If the SEC proposal for the 1986 connection of Coldstream and South Morang were adopted the Coldstream and Templestowe Terminal Stations would be needed in about 1991 if the fifth 500 000 volt Latrobe Valley to Melbourne line were erected on the northern easement.
- 3.25 Conversely, if the Coldstream and Templestowe Terminal Stations were developed in 1986, the Coldstream to South Morang 500 000 volt line would be needed by about 1989 to 1990 to maintain adequate transmission capability, with the fifth line following within a year or two and terminating at Coldstream.

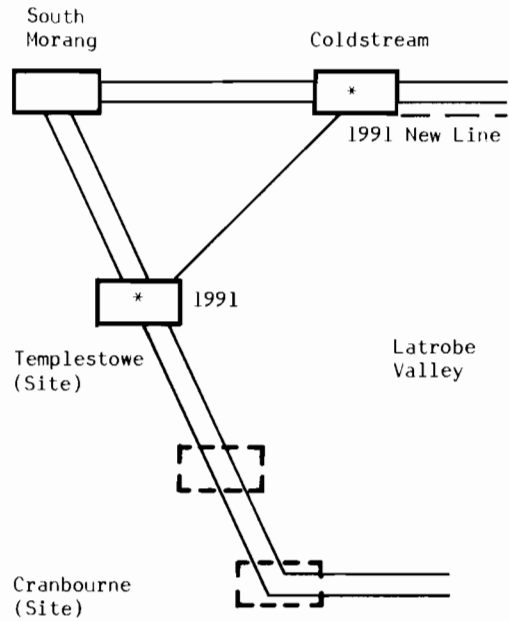
Development of the Narre Warren Terminal Station

- 3.26 It might be thought that another way of terminating the fourth 500 000 volt Latrobe Valley to Melbourne line would be the early establishment of a further 500 000/220 000 volt transformation point to the east of Melbourne.

FOURTH 500 000 VOLT TRANSMISSION LINE

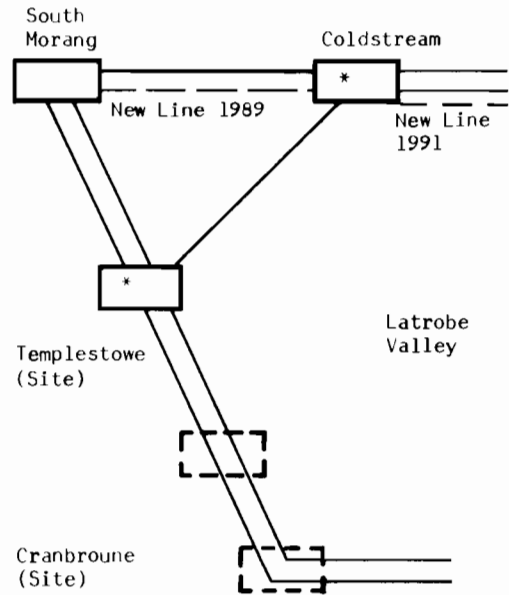
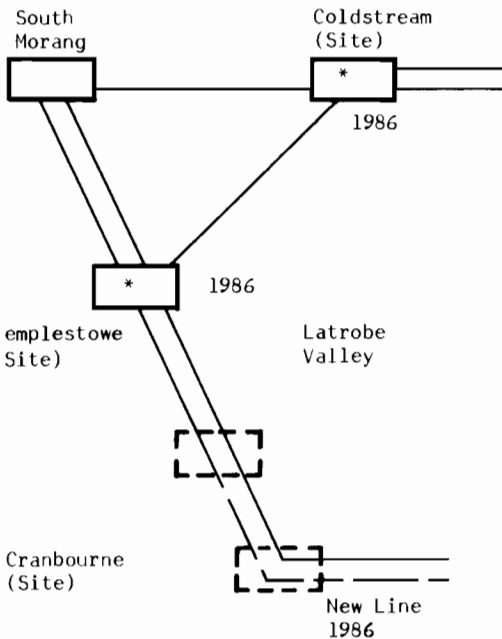


FIFTH 500 000 VOLT TRANSMISSION LINE



(a) SECV Proposal.

* Switching Station.



(b) Early Establishment of Coldstream and Templestowe.

* Switching Station.

FIGURE 3-5: TRANSMISSION LINE & TERMINAL STATION ARRANGEMENTS FOR FOURTH & FIFTH 500 000 VOLT TRANSMISSION LINES FROM LATROBE VALLEY

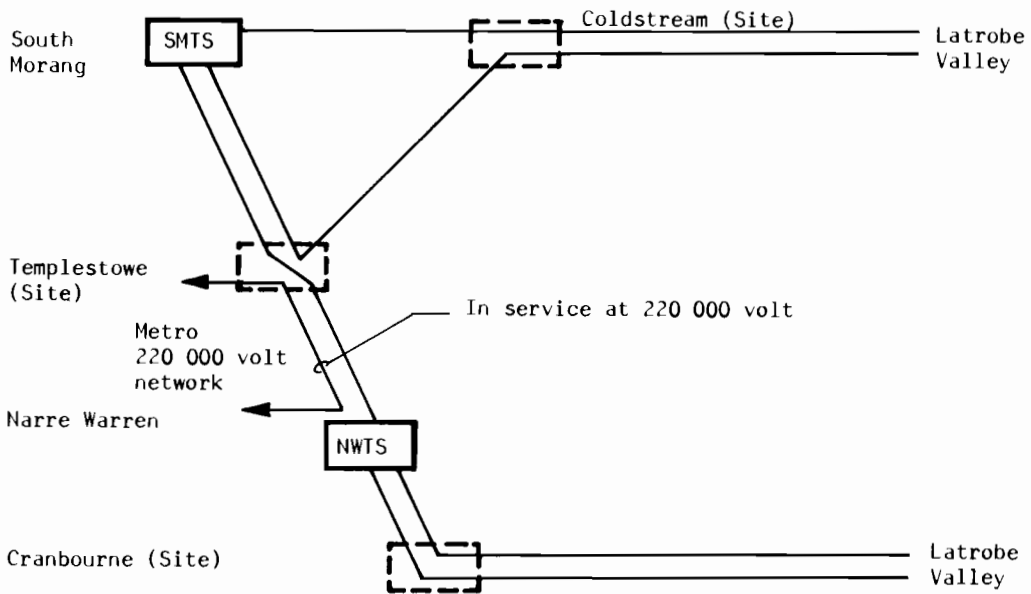
- 3.27 The timing of the next transformation point will of course depend on load growth, but it will almost inevitably be located to the east of Melbourne at Narre Warren. However, because of the strong 220 000 volt transmission system from the Latrobe Valley to Rowville, development of Narre Warren is not required before the early 1990s.
- 3.28 It would be possible to advance development of this transformation point, and to terminate the fourth 500 000 volt line at the Narre Warren Terminal Station (NWTS). However, this would leave only a single 500 000 volt connection from Narre Warren to South Morang and the system would be insecure against failure of this circuit (refer to Figure 3.6). Moreover, the minimum development of Narre Warren as a transformation point would cost around \$35 million and there would be the further cost of rearranging the 220 000 volt transmission lines into Rowville.
- 3.29 It is not, therefore, an effective alternative to the requirement for the Coldstream to South Morang line to allow termination of the fourth line at Narre Warren (refer to Figure 3.7).

Summary of the SEC Case

- 3.30 In summary, the completion of the 500 000 volt line from Coldstream to South Morang forms an integral part of the strategy for terminating the 500 000 volt lines from the Latrobe Valley. Connection of this line will be required in the long term even if other alternatives are implemented in the short term to avoid an immediate commitment to construction of this line.

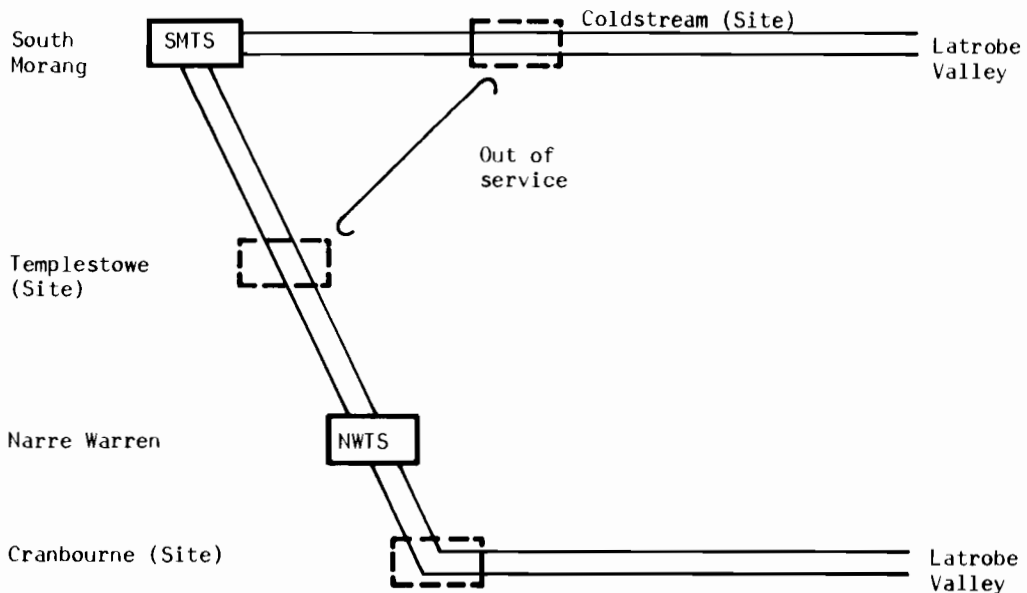
SUBMISSIONS AND EVIDENCE FROM OTHERS ON ALTERNATIVE ROUTES

- 3.31 A letter from the Minister of Conservation to Mr E.C. Stokes, Acting Chief Engineer of Transmission Development at the SEC, was produced as evidence by the Ministry for Conservation at the public hearing on 26 April 1983 (Appendix 5).



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE AT NARRE WARREN TRANSFORMATION STATION

Figure 3.6



TERMINATION OF FOURTH 500 000 VOLT TRANSMISSION LINE AT SOUTH MORANG AND TRANSFORMATION AT NARRE WARREN

Figure 3.7

This letter requested that the SEC examine alternative routes and the environmental effects of the Coldstream Terminal Station in an Environment Effects Statement. Similar statements were made in submissions and evidence by the following:

- Upper Yarra Valley and Dandenong Ranges Authority
- Mr. R.F. English
- Shire of Healesville
- Bend of Islands Conservation Association
- Conservation Council of Victoria

3.32 During the course of evidence being given to the Committee the following emerged :

- . Mrs. J. Mattiske representing the Bend of Islands Conservation Association indicated her Association's concern regarding the impact of the proposed line on the ecology of the recently created Environment Living Zone at the Bend of Islands and in particular on the billabongs of the Yarra River in the Conservation Zone. The Association was concerned about the proposed route, the procedures to be adopted in finalising the route and the method of construction of the line, but had not given consideration to alternative routes.
- . Mr. P Machin, Shire Engineer of the Shire of Healesville indicated his Council's concern regarding the impact of the line on the Environmental Living Zone and that his Council supported the need for an Environment Effects Statement to examine the optional routes and conditions that should be applied to the construction of the line. Mr. Machin indicated that if there were no existing transmission lines along the proposed route, his Council would strongly oppose the proposed line. However, as a transmission line and easement already existed he believed that if, on economic grounds, it was prudent to place a second transmission line along the easement, his Council would not oppose the proposal. His Council would, however, be highly concerned to ensure that adequate conditions were applied as a condition of approval of the construction of the line.

Mr. G.N. Prattley, Director of the Upper Yarra Valley and Dandenong Ranges Authority indicated that of the alternatives put forward by the SEC, only the preferred route and the alternative option LV2 would have an impact within the area covered by his Authority. He made the following statement (at p. 124 of the Minutes of Evidence):

"I think it is fair to say that, potentially, the northern route to Donnybrook (LV2) would have made a major impact and require a further crossing of the Yarra River. It would involve further lining of the Christmas Hills escarpment and run close to the vicinity of the King Lake National Park. At that superficial level it is the view of the Authority that the alternative (LV2) would have a greater impact than the duplication of the existing lines"

Mr. Prattley went on to voice his concern for the impact of the line on the Environmental Living Zone and supported the need for an Environment Effects Statement.

Mr. English, a resident of the Bend of Islands Environmental Living Zone, has a house and property immediately adjacent to the proposed transmission line easement. Apart from expressing doubt that a need has been established for the line, which has been dealt with earlier in this Report, Mr. English was concerned that the alternatives put forward by the SEC were not options in the mind of the SEC.

Mr. English was concerned about the effect on people and animals caused by high frequency radiation which he believed might be emitted by the power lines. He also mentioned the possibility of other electrical effects and cited these potential electrical effects as being a good reason for undergrounding the line.

Mr. English questioned the advisability of having two transmission lines within the one easement. He felt that the potential for loss of both lines simultaneously was increased in the event of a bush fire or extreme wind storm, and that the Environmental Living Zone was a high fire risk area.

As mentioned in Paragraph 2.22 of this report, the Committee agreed to further questions by Mr. English being raised in writing with the SEC. This correspondence is attached to this report as Appendices 1,2,3 and 4.

Mr. English raised two alternative options; the first was to replace the 220 000 volt Latrobe Valley to Rowville transmission lines by 500 000 volt lines; the second was to modify the SEC route LV3 so that it went from Templestowe to South Morang (instead of Keilor) via upgraded 220 000 volt transmission lines.

The SEC's reply to the first alternative was that with present and predicted loading on the system, it would not be possible to take a 220 000 volt double circuit line out of service for an extended period until additional 500 000 volt transmission capacity and both 220 000/500 000 volt and 500 000/220 000 volt transformation capacity had been installed. It was planned that this should happen at some time in the future: However, premature conversion of these lines would lead to considerable additional capital expenditure at an earlier date than was absolutely essential.

The SEC's reply to the second alternative was that the cost of this alternative would be \$21 million compared with \$11 million for the proposed route LV1. There would also be very considerable difficulty in finding an easement between Thomastown and South Morang.

In a final letter (Appendix 4) Mr. English indicated that he was still not satisfied with the basis of the SEC's planning and that he would prefer the adoption of alternatives which would avoid the construction of the proposed line between Coldstream and South Morang. He believed that the long term advances in technology would allow the existing overhead line through the Environmental Living Zone to be replaced by an underground line.

Mr. English suggested that the Committee should obtain independent advice on the costing of alternatives and that the Committee should investigate ways and means of having the SEC's long term planning improved and a proper energy conservation program introduced into their planning approach.

- 3.33 All the municipalities, through which the proposed line would pass, expressed support for the selection of the SEC preferred route LV1 in preference to option LV2.

DISCUSSION

Cost of alternatives

- 3.34 The evidence put forward by the SEC clearly indicates that the SEC proposal for the routing and termination of the fourth 500 000 volt transmission line from the Latrobe Valley to Melbourne including the reconnection of existing transmission lines, is the most economic of all the alternatives put before the Committee.

Security of alternatives

- 3.35 Options LV2 and LV3 provide advantages of diversification of termination points for the four 500 000 volt lines from the Latrobe Valley to Melbourne. The preferred option LV1 results in all four lines originating from the Hazelwood Terminal Station and terminating at the South Morang Terminal Station. In addition the supplies from the Victorian Hydro Stations and from the Snowy River Hydro Electric System also terminate at the South Morang Terminal Station.
- 3.36 At the present time, approximately 1 700 MW are transmitted from the Latrobe Valley at 220 000 volts via the central easements to Rowville

and 500 MW can be generated at Newport Power Station. Thus not all the power supplies to Melbourne pass through the South Morang Terminal Station.

- 3.37 The terminal stations at Hazelwood and South Morang are constructed and laid out in such a way that the majority of possible faults or incidents in the terminal stations can be overcome or bypassed in a very short period of time. The interconnection of the two terminal stations by four transmission lines over two widely separated easements provides a high degree of reliability in the actual interconnection. In the longer term the Committee considers that the terminal networks in the Latrobe Valley and in the outer metropolitan area should be designed so that a major disaster at South Morang or Hazelwood Terminal Stations will not totally disrupt the metropolitan power supply system. The Committee considers that the most appropriate time for the terminal networks to be formally reviewed would be coincident with the review of the proposed fifth 500 000 volt line from the Latrobe Valley to Melbourne foreshadowed by the SEC in their Submission. (See 2.35)

Environmental Impact of Alternatives

- 3.38 Of the three initial options put forward by the SEC, (LV1, LV2 and LV3) the preferred route (LV1), and route (LV3) have the least environmental impact. Route (LV1) follows an easement which already has an identical 500 000 volt transmission line running along it. Route LV3 follows an existing easement occupied by two double circuit 220 000 volt transmission lines, the new 500 000 volt transmission line could replace one of the existing 220 000 volt lines and the other 220 000 volt line could be upgraded.
- 3.39 The easement for the preferred route (LV1) passes through sensitive areas in the Bend of Islands Environmental Living Zone and considerable care will have to be taken with the design and construction of the line.
- 3.40 As was pointed out by Mr. Prattley of the Upper Yarra Valley and Dandenong Ranges Authority, route LV2 could involve a further crossing of the Yarra River, a further line cutting across the Christmas Hill

escarpment and the line might also pass close to the Kinglake National Park. However, route LV2 has not been defined by the SEC other than in a conceptual sense. It would be quite feasible for this route to pass along the easement proposed for LV1 and then to diverge as it approached the South Morang Terminal Station, by-passing the Terminal Station and continuing on to Donnybrook.

- 3.41 Likewise, construction of the LV3 alternative could be achieved by construction of the LV1 line and utilising the existing Templestowe to South Morang line freed by the construction of the LV1 line to by-pass South Morang and continue on to the Keilor Terminal Station.
- 3.42 Both the options for routing just identified would minimise the costs of the LV2 and LV3 options but in both cases the environmental effects would be greater than in the case of LV1, because of the additional lengths of line from South Morang to Donnybrook or Keilor.
- 3.43 The other alternatives put forward by the SEC which involve the early development of terminal stations at Coldstream, Templestowe or Narre Warren might delay the requirement for the transmission line between Coldstream and South Morang at some considerable additional economic cost.
- 3.44 The various alternatives raised by Mr. English in Appendices 1 and 4 which might avoid or delay the construction of the Coldstream to South Morang Line, would result in considerable cost penalties being incurred if they were adopted at this stage of the transmission system development.

CONCLUSIONS

- 3.45 The Committee concludes that:
 - (i) The arrangements proposed by the SEC for routing and terminating of the fourth 500 000 volt transmission line from the Latrobe Valley to the outer Melbourne Metropolitan Area,

(including the reconnection of existing transmission lines) would appear on balance to be the most favourable of the alternatives for reasons of cost, security of supply to the outer metropolitan area and potential environmental impact;

- (ii) The undergrounding of part or all of this transmission line cannot be economically justified; and
- (iii) As the effects of radiation associated with electrical fields were adequately addressed in the Portland Transmission Line Inquiry this aspect does not require further reporting or investigation at this time.

RECOMMENDATIONS

- 3.46
- (i) The feasible route to be subjected to detailed examination of environmental issues should be that proposed by the SEC running along the same easement as the existing line from Hazelwood to South Morang between Coldstream and South Morang (route LV1).
 - (ii) The Environment Effects Statement to be prepared on the proposed Coldstream to South Morang line at the request of the Minister for Conservation should examine in detail the environmental effects of the SEC proposed Coldstream to South Morang 500 000 volt transmission line. The Statement should also examine in principle only, the relative environmental impact of alternative transmission lines discussed in this Report.

CHAPTER FOUR

ALTERNATIVE PROCESSES FOR OBTAINING PLANNING APPROVAL TO CONSTRUCT THE LINE FROM COLDSTREAM TO SOUTH MORANG

THE CASE PUT FORWARD BY THE SEC

4.1 Suggested alternative processes that could be adopted to give approval for construction of the Coldstream to South Morang line are outlined in the following paragraphs:

- . On the basis of the line being constructed adjacent to the existing line and in the existing easement.
- . On the basis of the line being constructed on an alternative route.

Construction adjacent to the existing line within the existing easement

4.2 Easement provision was made at the time the first 500 000 volt line was established between Coldstream and South Morang in 1969 for a second line to be constructed adjacent to the first line. Responsible authorities and landowners were made aware of this provision so that planning in the areas affected could take account of the ultimate development. The route of the line in the Eltham area was subject to a public hearing conducted by the Town and Country Planning Board.

4.3 To construct the second line in the easement, it is necessary to obtain planning approval. In the past, this would have been achieved using the established planning procedures with application for permit being made to the responsible authorities along the route.

- 4.4 The responsible authorities in this case are the various Shire Councils, the Melbourne and Metropolitan Board of Works and the Upper Yarra Valley and Dandenong Ranges Authority, as listed in Figure 4.1.
- 4.5 This list also indicates the planning zones through which the proposed line would pass. It should be noted that planning scheme amendments will be required for the proposed line in the Shire of Healesville, Stream Reserve, Environmental Living and Conservation Zones before permits could be issued.
- 4.6 Public involvement is provided for, through the requirements of the planning procedures.
- 4.7 In addition to the formal procedures, it has been the SEC's practice to hold discussions with councils and council officers, to inform landowners affected by the proposals and to comply with any council requirements for informing ratepayers in their municipalities.
- 4.8 The steps in the procedure which would apply if the SEC traditional processes were followed, are to:
- (i) Discuss the proposal with the Ministry for Conservation for its assessment on the need for an Environment Effects Statement;
 - (ii) Discuss the proposal with the Melbourne and Metropolitan Board of Works, Upper Yarra Valley and Dandenong Ranges Authority (if appropriate) Shire Engineers and determine any special considerations requiring attention in the application for permit;
 - (iii) Address meetings of Councils to explain proposals;
 - (iv) Apply to the Melbourne and Metropolitan Board of Works and each Shire Council for permits and issue of Environmental Effects Statement (if required);

PLANNING SCHEME ZONES
FOR PROPOSED 500 000 VOLT TRANSMISSION LINE
COLDSTREAM TO SOUTH MORANG

FIGURE 4.1

| | Within MMBW Planning Boundary | | | | Within Upper Yarra Valley and Dandenong Ranges Authority | | |
|--|-------------------------------|-------------------------|-----------------|----------------------|--|--|---|
| | Shire of Whittlesea | Shire of Diamond Valley | Shire of Eltham | Shire of Healesville | Shire of Lillydale | | |
| Reserved Light Industrial | X | | | | | | |
| Corridor A | X | X | | | | | |
| Conservation A | X | X | | | | | |
| Existing Public Open Space | X | | | | | | |
| Landscape Interest A | | X | X | | | | |
| Public Purposes Lillydale Sewerage Authority | | | | | | | X |
| Reserved Living | | X | | | | | X |
| Extractive Industry | | | | | | | X |
| Stream Reserve | | | | | X | | |
| Extractive Ind Buffer Zone | | | | | | | X |
| Public Purposes MMBW | | | | | X | | |
| Rural Zone | | | | | | | X |
| Environmental Living | | | | | X | | |
| Conservation | | | | | X | | |
| General Farming 1 | | | | | | | X |
| General Farming 2 | | | | | | | X |

- (v) Inform the public and affected landowners of proposal and conduct any additional public information sessions, such as public meetings, as required by the Shires;
- (vi) Receive a Notice of Determination issued by the responsible authorities;
- (vii) Follow the planning appeals procedure if appeals are received; and
- (viii) Issue permits depending on outcome of appeals.

4.9 This procedure is set out diagrammatically in Figure 4.2 and is essentially a process which utilises the existing planning procedures, whereby the SEC would apply for approval to construct the line from each of the responsible authorities.

4.10 An alternative process was indicated in the Minister for Conservation's letter (Appendix 5) in this case. The Minister suggested that:

- (i) The SEC would prepare and issue the Environment Effects Statement on the proposal for public comment; and
- (ii) The Minister for Planning and Conservation would establish an independent panel under the provisions of the Environmental Effect Act 1978 and the Town and Country Planning Act 1961 to receive submissions, conduct public hearings and make a recommendation to the Minister for Planning and Conservation on any special measure required in the design, construction and provision for maintenance of the line to protect the environment.

FIGURE 4.2

COLDSTREAM TO SOUTH MORANG 500 000 VOLT LINE

POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL USING
EXISTING PLANNING PROCEDURES

| | |
|---|---|
| <p>INVESTIGATION OF IMPACT ON ENVIRONMENT, PUBLIC LANDOWNERS</p> | <p>SEC in consultation with -</p> <ul style="list-style-type: none"> . Responsible planning authorities . Ministry for Conservation . Public authorities . Community groups . Landowners |
| <p>PREPARATION OF EES</p> | <p>SEC in consultation with Ministry for Conservation</p> |
| <p>EES ISSUED FOR PUBLIC COMMENT</p> | <p>SEC in consultation with Ministry for Conservation</p> |
| <p>APPLICATION TO RESPONSIBLE AUTHORITIES FOR PERMIT</p> | <p>SEC</p> |
| <p>ADVERTISEMENT AND DISCUSSION ON PROPOSAL AS REQUIRED BY INDIVIDUAL RESPONSIBLE AUTHORITIES</p> | <p>SEC</p> |
| <p>ANALYSIS OF PUBLIC COMMENT ON EES</p> | <p>SEC and Ministry for Conservation</p> |
| <p>ASSESSMENT OF ENVIRONMENTAL EFFECTS</p> | <p>Minister for Conservation</p> |
| <p>DEVELOPMENT OF CONDITIONS ON PERMIT</p> | <p>Individual responsible authorities in consultation with SEC and Ministry for Conservation</p> |
| <p>NOTICE OF DETERMINATION</p> | |
| <p>APPEAL HEARINGS (IF OBJECTIONS RECEIVED)</p> | |

- 4.11 The Minister for Planning and Conservation would then recommend to the Governor in Council that the line be exempt from further planning procedures under section 35(d) of the Town and Country Planning Act 1961. This procedure is set out diagrammatically in Figure 4.3.
- 4.12 Both processes allow a similar level of public participation; however, the second process provides a more co-ordinated approach to the consideration of the whole route. As the route passes through five Shires and is covered in an overall planning sense by the MMBW and the Upper Yarra Valley and Dandenong Ranges Authority, the normal planning process would require individual negotiations with each of these bodies and could involve protracted discussion on permit conditions and a planning scheme amendment in the Shire of Healesville and hearings on planning scheme amendment submissions by an independent panel, and be further complicated by appeals and hearings by the Planning Appeals Board.

Construction of the proposed line on a new route

- 4.13 To construct the line on a new route would require the establishment of a new easement with the associated environmental analysis and public inquiry to determine a suitable route.

This procedure would be identical to that set out in Figure 4.3.

FIGURE 4.3

COLDSTREAM TO SOUTH MORANG 500 000 VOLT LINE

POSSIBLE PROCESS FOR ASSESSMENT AND APPROVAL
USING INDEPENDENT PANEL

INVESTIGATION OF IMPACT
ON ENVIRONMENT, PUBLIC
LANDOWNERS

SEC in consultation with -

- . Responsible planning authorities
- . Ministry for Conservation
- . Public authorities
- . Community groups
- . Landowners

PREPARATION OF EES

SEC in consultation with
Ministry for Conservation

EES ISSUED FOR
PUBLIC COMMENT

SEC in consultation with
Ministry for Conservation

INDEPENDENT PANEL ESTABLISHED
UNDER EE ACT AND T&CP ACT

Minister for Conservation
and Planning

PUBLIC INFORMATION
AND DISCUSSION

SEC in consultation with -

- . Responsible planning authorities
- . Ministry for Conservation
- . Public authorities
- . Community groups
- . Landowners

ANALYSIS OF COMMENT AND REVIEW
OF PROPOSAL

SEC and Ministry for Conservation

SEC SUBMISSION TO PANEL RELEASED

PANEL HEARING

PANEL RECOMMENDATION TO MINISTER

MINISTER FOR PLANNING RECOMMENDS TO
GOVERNOR IN COUNCIL THAT PROPOSAL
BE EXEMPT FROM FURTHER PLANNING
PROCEDURES

Procedure for approval of the section of the
fourth 500 000 volt transmission line between
Hazelwood and Narre Warren

- 4.14 Evidence was provided by the SEC which detailed the approval processes already followed, or to be followed, for the Hazelwood to Narre Warren section of the fourth 500 000 volt transmission line between the Latrobe Valley and the outer Melbourne Metropolitan area. This evidence will be considered in the final report of the Committee in relation to the overall terms of reference.

SUBMISSIONS AND EVIDENCE FROM OTHERS
ON ALTERNATIVE PROCESSES FOR PLANNING APPROVAL.

- 4.15 Written submissions were made by the following on the possible processes for planning approval for the proposed transmission line.

Ministry for Conservation
Upper Yarra Valley and Dandenong Ranges Authority
Shire of Eltham
Shire of Healesville
Shire of Lillydale
Shire of Whittlesea
Conservation Council of Victoria
Bend of Islands Conservation Association

- 4.16 In addition, Mrs. J. Mattiske from the Bend of Islands Conservation Association; Mr. G.N. Prattley, Director of the Upper Yarra Valley and Dandenong Ranges Authority; Mr. P. Machin, Shire Engineer of the Shire of Healesville; and Mr. I. Cowdell, Assessment Officer from the Ministry for Conservation gave evidence on this matter. All those who gave evidence agreed that an Environment Effects Statement was necessary and that it would be desirable to have a single inquiry looking at planning approval for the whole line.

- 4.17 The question of the use of section 35(d) of the Town and Country Planning Act 1961 was discussed in some detail with Mr. Prattley who indicated that, in his opinion, the Regional Strategy Plan was prepared under the separate legislation of the Upper Yarra Valley and Dandenong Ranges Authority Act 1976 and therefore the powers of the Governor in Council provided in section 35(d) of the Town and Country Planning Act, to exempt certain works from planning controls on the recommendation of the Minister for Planning, did not apply to the Regional Strategy Plan. Mr. Prattley indicated however, that the preface to the Regional Plan states that the Authority recognises the process whereby proposals such as those for major utility installations are subject to oversight by Parliamentary Committees or the State Co-ordination Council.
- 4.18 Mr. Prattley went on to agree that should an independent panel be appointed to make recommendations to the Minister for Planning, the Authority would accept this approach, provided that the Authority had the opportunity to make a submission to the panel.
- 4.19 Mr. Machin, Shire Engineer from the Shire of Healesville, expressed a personal comment that it would be more desirable to have a single panel review the proposed line, rather than allowing all the Councils to be involved in separate review processes, provided that the Governor in Council was able to specify conditions to be applied to the exemption relating to the construction of the line.
- 4.20 In a letter dated 17 March 1983, to the Committee the Shire of Lillydale made the following comments:

"In relation to planning methodology..... my Council wishes the maximum public involvement in a planning process so that those people affected by such installations (transmission lines and terminal stations) will have an opportunity to express their views to the appropriate tribunals."

The Shire also indicated that it would be gravely concerned if the large area of land acquired for the Coldstream Terminal Station which is at a significant point in the general landscape, were to be developed in ways other than those indicated by the SEC at this time .

- 4.21 In a letter dated 22 April 1983, the Shire of Eltham indicated that it had examined the two alternative approval processes set out by the SEC in its paper of March 1983 and advised that the Council re-affirmed its previous advice that it believes the SEC should apply to the Council for the relevant planning permit. The Council was not represented at the hearing on 26 April.
- 4.22 Mrs. Mattiske from the Bend of Islands Conservation Association indicated that her Association had discussed the alternative but had not expressed a preference for the approval process to be used. Mrs. Mattiske felt that the members generally would agree that an independent panel would both expedite the process and examine the problems in a better way. The Association had expressed a desire that an Environment Effects Statement be produced.
- 4.23 Mr. Cowdell from the Ministry for Conservation presented the letter from the Minister for Conservation to Mr Stokes of the SEC (Appendix 5) as evidence. The letter states:

"In commenting on the possible approval procedures put up by your Commission to the Natural Resources and Environment Committee, I would indicate that at this stage my preference is for assessment of the Environment Effects Statement by a panel appointed by me. The model for this is the Rosedale - Bairnsdale transmission line enquiry currently being examined by such a panel. A panel could have regard to planning matters, and my assessment would be provided to the Minister of Planning and other decision-makers after receipt of the panel's report.

I am hoping that the Natural Resources and Environment Committee will include in its recommendations an indication of the best method of catering for the requirements of all the responsible authorities involved in this exercise."

- 4.24 Mr. Cowdell also provided the Committee with information on the composition of the panel associated with the Rosedale to Bairnsdale Transmission Line Inquiry.

CONCLUSIONS

- 4.25 The Committee concludes that:
- (i) The normal planning approval processes would be unnecessarily complex and lengthy in the case of the proposed Coldstream to South Morang Transmission Line.
 - (ii) The most appropriate procedure in this case, if and when, it has been determined that it is appropriate for a transmission Line to follow the proposed route between Coldstream and South Morang, would be for the Minister for Planning to request the Governor in Council to exempt the line from planning controls under section 35(d) of the Town and Country Planning Act 1961. This request would follow the preparation of an Environment Effects Statement by the SEC and the holding of a public inquiry by an independent panel appointed by the Minister for Conservation under Section 9 of the Environment Effects Act 1978.
 - (iii) In view of the sensitive areas through which the proposed transmission line may pass it may be important that conditions be applied to the process of construction of the transmission line along the route eventually selected. These conditions could take the form of conditions upon which the Governor in Council agrees to exempt the transmission line from planning control or could be agreed between the Minister for Planning and the Minister for Minerals and Energy as a condition of the Minister for Planning applying to the Governor in Council for exemption of the transmission line from planning controls.
 - (iv) It is unlikely that the Upper Yarra Valley and Dandenong Ranges Regional Strategy Plan will require any amendment to allow the transmission line to be constructed along the existing easement as the proposed inquiry procedure falls within the general intent of procedures set out in the Regional Strategy Plan for approval of major utility installations.

- (v) The Melbourne Metropolitan Planning Scheme falls under the ambit of the Town and Country Planning Act 1961 and use of section 35(d) of this Act would exempt the transmission line from the requirements of the Melbourne Metropolitan Planning Scheme.

RECOMMENDATIONS:

- 4.26
- (i) An Environment Effects Statement (EES) should be prepared by the State Electricity Commission;
 - (ii) The EES should be advertised and made available to the general public and in particular to landholders along the route of the proposed line. The advertisement should make clear the approval procedure which will be followed;
 - (iii) The Minister for Conservation should appoint an independent panel in accordance with section 9 of the Environment Effects Act 1978, and should consider limiting the terms of reference of this panel so that matters already examined in this Report are not unnecessarily re-examined. The panel should be asked to recommend to the Minister for Planning whether or not the proposed line should be approved, and if so, what conditions, if any, should be applied to the construction of the line;
 - (iv) On receipt of the independent panel's recommendations the Minister for Conservation should make his assessment as required by the Environment Effects Act 1978 and provide it to the Minister for Planning;
 - (v) Having received the Minister for Conservation's assessment, and providing that approval of the proposed line has been recommended by the independent panel and agreed to by the Minister for Planning, the Minister should seek the formal

agreement of the Minister for Minerals and Energy and the State Electricity Commission, that the Commission will abide by conditions to be applied to the construction of the line as specified by him; and

- (vi) If such an agreement is obtained the Minister for Planning should apply to the Governor in Council for the construction of the transmission line to be exempt from planning control under section 35(d) of the Town and Country Planning Act 1961.

ACKNOWLEDGEMENTS

4.27 This is the first Report the Committee has had the honour to present to Parliament, and the supporting inquiry and deliberations have proved a most stimulating, demanding and rewarding exercise for all Committee Members.

This inquiry has also been characterised by a great deal of involvement by several Government Bodies, various municipalities, community groups and individuals and for this the Committee is most appreciative.

The Committee also thanks its staff for the work performed in the conduct of the inquiry and in assembling this Report.

Finally, the Committee thanks the Hansard staff for the reporting of the various public hearings.

Committee Room
2 June 1983

APPENDIX 1

Skyline Road
KANGAROO GROUND 3097

28 April 1983

The Secretary
Natural Resources & Environment Committee
Parliament House
MELBOURNE VIC 3000

Dear Sir

RE : COMMITTEE HEARING 26.4.83 RE
COLDSTREAM TO SOUTH MORANG 500KV LINE

In response to the S.E.C. submission to the hearing of the 26 April, would you please direct the following queries to the SEC. I appreciate the opportunity to pursue these questions through your Committee and trust that this will help expediate answers and enable your Committee to reach its deadlines.

1. Section 1.1

- (a) What is the cost of upgrading only one of the 220KV double circuit lines terminating at Rowville Terminal Station, to 500KV?
Cost of upgrading two of the 220KV lines?
Cost of upgrading the three of these 220KV lines to 500KV?
- (b) If the Latrobe Valley Brown coal power stations output is currently in excess of 75% of installed capacity for much of the year i.e. 3150MW, would this represent average daily demand at generators or peak demand at generators? What does "much of the year" refer to, over the past two years, where output is in excess of 75% of installed capacity. (i.e. for how many hours per month).

2. Section 1.2

On page 4. the present maximum generation in the Latrobe Valley is 3300MW. In the "Long Term Forecasts", maximum demand at generators in 1982 was 4600MW.

- (a) Therefore, is approximately 1300MW of peak demand supplied from other plant?
- (b) Have the forecast growth in maximum demand at generators been inflated in 1985/86 by approximately 250MW and 1987/88 by approximately 500MW to cater for the Alcoa Portland demand?

- (c) Does the S.E.C. have a definite commitment to meet a demand of (ref. 2(b) above) 250MW in 1985/86 and 500MW in 1987/88 for the Portland smelter?
- (d) Is the daily peak, winter demand one of the reasons for the Latrobe Valley generation export level escalating to 5100MW by 1987/88?
- (e) Does the S.E.C. have any plans to either spread or decrease the heavy load that peak winter demands place on the system? If yes, what are the plans?

3. Section 1.3

- (a) Could you give details of failure of the 500KV lines over the past 12 months, showing the day and time and the time taken to get them back into service?
- (b) What demand at the generator can Newport, Richmond, MCC, Anglesea and the hydro supplies provide if a 500KV line fails?

4. Section 1.4

- (a) Can you explain how during construction works, one 500KV line temporarily taken out of service reduces the systems existing capacity by 1000MW?
- (b) Can you describe the extensive periods that a 500KV line would be taken out of service for reconnection?

Could you advise the approximate hours and for approximately how many days would be involved?

Do these periods have to coincide with the time the peak winter demand occurs?

5. Section 2.1

Comment on page 10. re the Coldstream to Templestowe line "to provide for later development of supply for the north-eastern metropolitan area". Does the S.E.C. expect a future growth in some sector of the N-E metro. area?

If yes, in what specific area? If further growth is expected does this mean the Templestowe Terminal Station will need eventual upgrading?

6. Section 2.5

- (a) If an Environmental Effects Statement is prepared in terms of Exhibit 5., will option LV3 - Templestowe to Keilor Line, be included in any study.
- (b) Has the upgrading of this 220KV line to 500KV been considered as a viable early alternative? This to be then followed by other options under LV3?
- (c) Is it possible to feed this 500KV line from Templestowe into a nearer Terminal Station in the metropolitan area?
- (d) How long would the 220KV line be out of service and could these periods be planned to avoid peak demand periods?

7. Section 2.6


- (a) Are detailed costings available for undergrounding, say the Templestowe to Keilor option?
- (b) Is there a full research programme being undertaken by the S.E.C. to improve the technology for undergrounding high voltage transmission lines?

8. Exhibit 6.

- (a) Templestowe & Coldstream Terminal Stations. With the reference to one of the lines between Templestowe and South Morang being taken out of service for maintenance, is that maintenance likely to occur during a period of maximum peak demand or are these periods avoided?
- (b) Regarding the comment of the termination of the single 500KV line at Narre Warren, has the extension of this line by constructing an additional 500KV line to Templestowe from Narre Warren plus the upgrading of the Templestowe to South Morang 220KV line to 500KV, been considered, and what is the cost?

Thanking you for your consideration with these queries.

Yours faithfully



R.F. ENGLISH

APPENDIX 2

13 May 1983

COLDSTREAM TO SOUTH MORANG 500 000 VOLT TRANSMISSION LINE

RESPONSE TO QUESTIONS RAISED BY MR R F ENGLISH

Q1 (Section 1.1)

a We understand the intent of this question concerns upgrading of 220 000 volt double circuit current transmission lines to 500 000 volt to establish whether the fourth 500 000 volt transmission line could be constructed on the "central easement" from the Latrobe Valley to Melbourne. This easement is indicated in Figure 1.1 attached, extracted from the SEC Submission on the Coldstream to South Morang transmission line.

Planning for the transmission from the Latrobe Valley to Melbourne is based on integrated development of three easements, northern, central and southern, as indicated on Figure 1.1. This arrangement has been planned to ensure supply would not be unduly dependent on any single easement which could be interrupted by, for example, a bushfire. For this reason, the fourth 500 000 volt line has been planned to be developed on the southern easement to give a balanced easement loading.

The central easement has been planned to be ultimately redeveloped with 500 000 volt transmission lines to maximise the use of the existing easements. This will require demolition of the 220 000 volt transmission lines and replacement with new 500 000 volt towers. The 220 000 volt towers could not be converted to 500 000 volt operation. The 220 000 volt transmission lines presently transfer the Yallourn power station output and some power from Hazelwood and Jeeralang to Melbourne and each double circuit line carries about 600 MW. The central easement 220 000 volt transmission lines cannot be demolished until equivalent additional capacity is provided by 500 000 volt transmission.

Hence, the 500 000 volt transmission and the associated Coldstream to South Morang line has to be developed prior to any reuse of the central easement.

b This question concerns the role of Latrobe Valley plant in meeting system load in particular system peak load and whether the proposed transmission line is associated with these peaks.

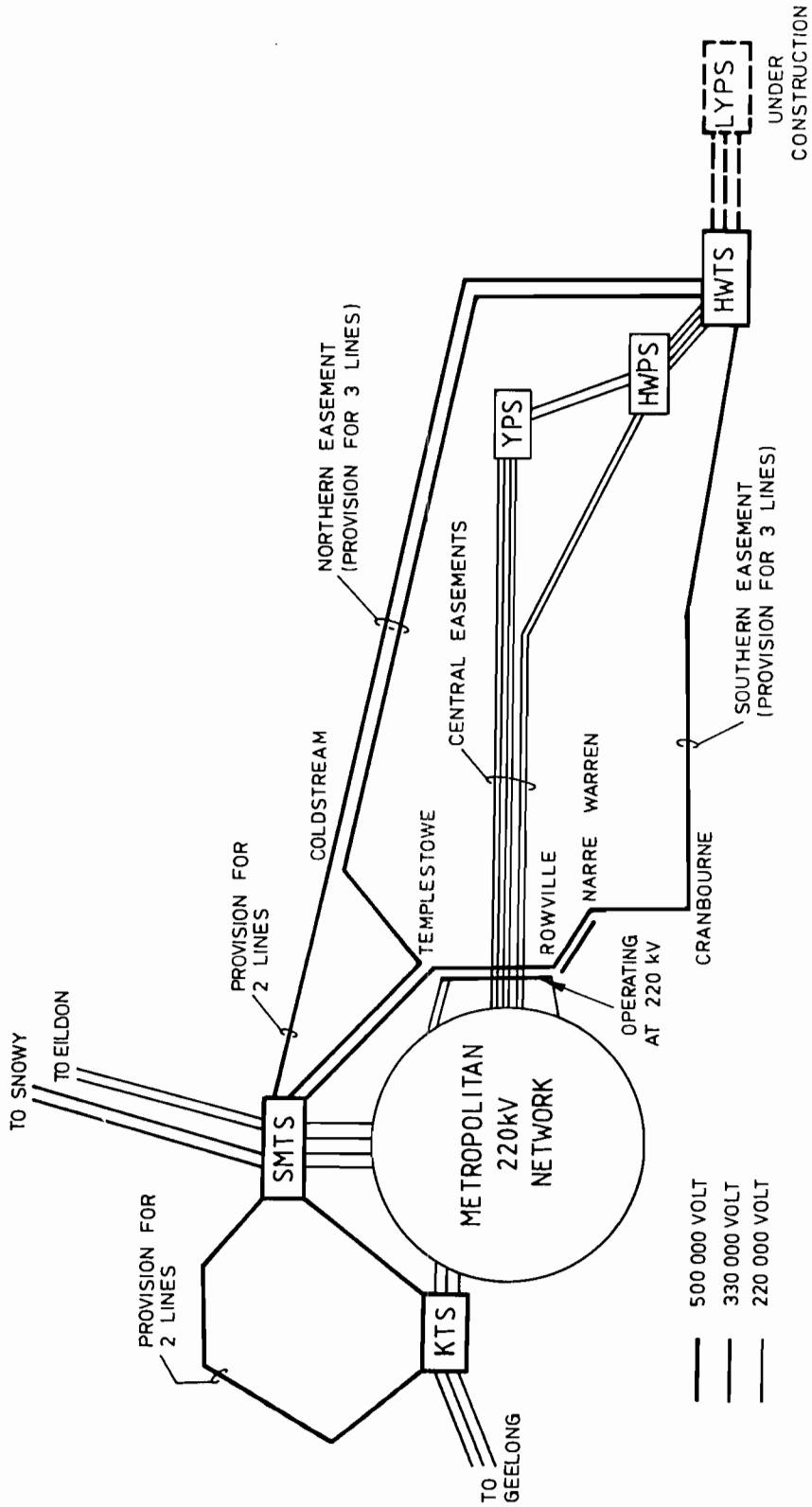


FIG 1.1
LATROBE VALLEY TO MELBOURNE TRANSMISSION - EXISTING

The Latrobe Valley power stations as indicated in the SEC Submission, generate at present 82% of State demand for electrical energy. These power stations therefore run at a sustained high output.

The output of the brown coal plant meets the overall system demand for energy and is not affected by the system peak demand. The peaks are met by operation of the 500 MW gas plant at Newport, 450 MW of Victorian hydro and draw from Snowy up to the entitlement of 1100 MW.

In 1981/82 on output of 3150 MW (75% of installed plant in the Latrobe Valley) was required for more than 75% of the time.

The planning for the Coldstream to South Morang section of the fourth line is based on these loading considerations.

Q2 (Section 1.2)

a As discussed in Section 1(b) peaking demand is met by -

- . gas stations;
- . Victorian hydro;
- . Snowy Mountains.

This generation is adequate to meet the peaking demand and is used within the constraints of available gas allocation, water storages and irrigation requirements.

Adequate reserve is available from the above plant to cover the normal expected outage of Latrobe Valley plant.

At the 1982 peak demand of 4618 MW, 3152 MW was provided from Latrobe Valley plant and 1466 MW was supplied from other sources on that particular day.

1300 MW is indicative of high load winter days and is a variable figure on any particular day, depending on system load and availability of Latrobe Valley generation plant. On this day of system peak load the Latrobe Valley out was of a similar level to the average Latrobe Valley output during the year.

b The SEC load forecasts indicated in "1982-1997 Long Term Electricity Forecasts" includes provision for supply to Alcoa at Portland of 250 MW in 1985/86 and a further 250 MW in 1987/88.

c The SEC has a contractual obligation to have provision for supply to Alcoa from October 1983.

d As explained in 1b Latrobe Valley brown coal plant is progressively installed to meet overall energy requirements and operates at a sustained high level. The level of Latrobe Valley brown coal generation basically does not change with the daily variation in demand and is essentially not affected by the system peak load.

e The SEC tariff policy for many years has included off peak rates as an incentive to reduce peak demands by transferring load to the periods of reduced demand where otherwise the brown coal plant would be under utilised. This approach has led to widespread use of off peak storage hot water systems, rather than instantaneous systems and it is intended to continue this policy. Typically, the average Victorian system load is 85% of the peak load on weekdays. This is a higher average loading than achieved on other mainland Australian States. Other possible methods of load management are kept under review.

Q3 (Section 1.3)

a The 500 000 volt transmission lines have been designed to be highly reliable in view of their importance to the system in transferring Latrobe Valley generation. In the 10 years since service, the lines have experienced an average of two failures per annum.

The outage times have averaged five hours with a maximum of two days. The system must be operated within line loadings determined by the possibility of a line failure. If the system was operated beyond this capability, a line failure could cause loss of system stability leading to a cascade shutdown of total supply to Victoria and possibly parts of NSW.

b Reserve generation is held in Newport and the Hydro stations to enable the Latrobe Valley generation to be reduced following line outage to the system capability with a 500 000 volt transmission line outage to the system capability with a 500 000 volt transmission line out of service. This capacity is normally adequate for the 1000 MW reduction in capability. The supply to Alcoa can be partially interrupted for limited periods to assist in off loading the Latrobe Valley transmission until rescheduling can be completed. These measures have been taken into account in selecting the date for completion of the fourth line construction.

Richmond power station which used oil fuel has been retired and the MCC station, which has a very high operating cost is too small to provide effective standby. It is to be retired after the 1983 winter. Anglesea power station is operated continuously by Alcoa to meet their requirements at Pt Henry and is not available as standby.

Q4 (Section 1.4)

a The transmission system as discussed in 3a must be operated within its capability including provision for line failure to minimise the possibility of total shutdown due to loss of synchronism.

During line construction with one line out of service, the effective electrical coupling between the Latrobe Valley and the rest of the system is markedly reduced. Hence, the power transfer level at which the system could remain stable is reduced and in the present instance this reduction corresponds to 1000 MW

b A number of reconnections involving the existing 500 kV lines are required to connect the new Coldstream to South Morang line into the system and to connect existing line sections between South Morang, Templestowe, Rowville, Narre Warren and Cranbourne, to the proposed new line from Hazelwood.

To achieve the final arrangement approximately five outages of existing lines of up to 15 days duration each will be required with an approximate total time of 8 weeks.

The work for each of the outages will be planned to co-ordinate as far as possible with system loading and generation availability requirements to avoid the possibility of security risks to the system due to loss of transmission capacity and/or the need for extended operation of uneconomic generation.

Q5 Section 2.1

The SEC has made provision for load development in Templestowe-Doncaster and surrounding areas. This provision consists of space on the Templestowe terminal station site for 500 000 volt switching and transformation and provision for development of Doncaster terminal station with 220 000 volt switching and transformation. The load growth in these areas is 3 to 5% per annum and is one of the highest load developments in the metropolitan area. There is no requirement to develop the Templestowe terminal station as a load supply point within the next 10 years on present indications.

Q6 Section 2.5

a The question of feasible options which should be subject to detailed environmental analysis is a matter which is expected to be decided by the Committee.

b The options included in the SEC Submission are all viable. The complications involved with LV3 of rebuilding the existing lines was mentioned on the SEC Submission and included in the cost estimates. The 220 000 volt lines cannot be upgraded to 500 000 volt. The option would involve demolition of the existing lines, and erection of a new 500 000 volt transmission line and a new 220 000 volt transmission line.

c The 500 000 volt line from Templestowe in Option LV3 could not be terminated at a station nearer to Templestowe than Keilor, i.e. South Morang as there is no available easement.

d Reconstruction of such 220 000 volt lines require successive outages for over a total period of possibly 12 months, taking into account the level Latrobe Valley generation at any particular time.

Q7 Section 2.6

a Costings for undergrounding of all options are included in the

SEC submission. For example for the Coldstream to South Morang line the cost for overhead is estimated at \$M11 and for underground at \$M133.

b The SEC is actively involved in development of techniques for undergrounding high voltage lines. Extensive undergrounding of 66 kV lines is used in the central business district and cable entries to stations has been utilised at 220 000 volt. A short section of the third and the proposed fourth 500 000 volt transmission utilises the latest technology of a SF6 duct or pipe to cross under other transmission lines.

The SEC keeps in constant contact with major manufacturers of high voltage cable and with other authorities utilising cable.

As indicated in the Commission submission the cost of underground cable is extremely high and manufacturers throughout the world are all seeking ways to minimise costs.

Q8 Exhibit 6

a In general, routine maintenance of major lines from the Latrobe Valley is scheduled for periods of reduced generation. However, as the Latrobe Valley plant is operated at sustained high levels to meet system energy demands, there is only limited flexibility for such maintenance consistent with keeping transmission costs to a minimum.

b The 220 000 volt connection from South Morang to Templestowe includes the 220 000 volt lines from South Morang to Thomastown.

These lines are currently heavily utilised to transfer Latrobe Valley and Snowy power to the metropolitan area and could not be removed from service without first constructing transmission to replace them. This would need to be on another easement.

APPENDIX 3



State Electricity Commission of Victoria

Monash House 15 William Street Melbourne
Box 2765Y GPO Melbourne 3001
Telephone 615 0433
Telex 31153
Cable & Telegraphic Address: Electrocom Melbourne

Our Reference

ht

1 June 1983

Mr R F English
Skyline Road
KANGAROO GROUND VIC 3097

Dear Mr English

In my letter of 16 May 1983, I provided answers to your questions (28 April 1983) regarding the development of the 500 kV supply to Melbourne. The answers set out details to give an understanding of the basis for the current planning.

The following specific information amplifies the previous answers and is provided in response to your request for specific details not included in the original reply:

QUESTION 1(a)

Replacement of each 220 000 volt double circuit line in the central easement with a 500 000 volt line would mean that 600 MW of power currently transferred to Melbourne by each line would need to be transported by the 500 000 volt network.

The elements in the rebuilding would be -

- . establishing additional transformation in the Latrobe Valley and metropolitan area to transfer power from Yallourn stations through the 500 000 volt network;
- . demolition of a 220 000 volt line;
- . construction of a 500 000 volt line.

In order to transfer 600 MW to the 500 000 volt network, 500 000/220 000 volt station developments would first be required in order to prevent unacceptable restrictions on Latrobe Valley power output following commissioning of the first LYPS unit. These developments would take at least three and a half years. That is, demolition could not commence until at least 1988 and construction of the line could not then be completed until at least 1989. The required date for the fourth 500 000 volt line for Loy Yang power is November 1986, and, therefore, reconstruction of a 220 000 volt line is not an alternative to the proposed fourth 500 000 volt line and the associated Coldstream to South Morang line.

The Commission does plan to replace the 220 kV transmission by 500 kV transmission in the longer term but the existing 220 kV transmission is a valuable asset and early replacement would have significant economic penalties.

For example, if at this time, replacement had been planned, the costs for establishing new 500/220 transformation in the Latrobe Valley and the metropolitan area for the first such 500 kV line and which would not otherwise be required for some ten years would be \$M40.

In addition to the cost of approximately \$M3 for demolishing the 220 kV line, for the first 220 kV line replacement, a further cost of \$M7 would be incurred to demolish and replace existing 66 000 volt lines (including 132 000 volt lines operating at 66 000 volt).

That is, notwithstanding the unacceptable service date, a total of approximately \$M50 would be required to be spent some ten years earlier than otherwise required to replace the first 220 kV double circuit line with a 500 kV line and the net effective increase in transmission capacity would only be 400-500 MW.

Construction of the fifth 500 kV line would then be required in advance of the planned date.

Some \$M13 would be required for 500/220 kV transformation not otherwise required for early replacement of each of the second and third 220 kV lines.

It is for these reasons that the SEC has not planned the replacement of the 220 kV transmission until a much later stage so that maximum utilisation can be made of existing 500 kV and 220 kV transmission resources.

QUESTION 3(a)

In view of the high reliability required for transmission lines supplying large blocks of load, failure statistics are normally quoted over extended periods of experience and the experience for any one year is unrepresentative. For the last twelve months one fault has occurred on the overhead 500 kV lines from the Latrobe Valley during normal service.

| | |
|-------------------|---------------------|
| Time: | 0931 hours |
| Date: | March 4, 1983 |
| Restoration Time: | 9 hours, 25 minutes |

This compares with the long term average experienced by the Commission previously indicated of two failures per annum, with a restoration time of five hours each.

QUESTION 7 (a)

Costing of underground options is based on the average rates per kilometre for undergrounding a 500 kV line in the metropolitan area as given in Table 4.1 of the November 1982 Report.

These costs are based on SEC knowledge of the world market for 500 kV cable supply and installation.

For the Templestowe to Keilor option, the costing was based on the total of cable supply and installation for a distance of about 32 km costing \$M166 as indicated in the Figure 3.2 of the November 1982 Report. The cost elements comprise approximately 56% for the supply of cable, 14% for trenching and laying, 20% for jointing and terminations and 10% for reactive compensation and station works.

QUESTION 8(b)

Connection of the fourth 500 000 volt line to the metropolitan network by a 500 000 volt line from Narre Warren to South Morang via Templestowe would entail -

- . use of the 500 000 volt line section from Narre Warren to Templestowe currently operating at 220 000 volt (as planned for the SEC proposal);
- . replacement of the two 220 000 volt lines from Templestowe to Thomastown by one higher rated line and construction of a 500 000 volt line on the easement released;
- . construction of a 500 000 volt line from Thomastown to South Morang. The existing 220 000 volt lines could not be demolished at this stage due to their continued high loading. The acquiring of new easement for 500 000 volt transmission in the Thomastown to South Morang area was considered impractical by the SEC.

The total cost of the connection would be at least \$M21 if easement could be made available, compared with \$M11 for the Coldstream to South Morang connection.

...

...

As an overall comment, SEC transmission planning has proceeded on the basis of integrated use of the three easements from the Latrobe Valley to Melbourne which have been established in order to cater for the long term power transfer requirements from the brown coal power stations.

The third (southern) easement was approved following a public inquiry by the Parliamentary Public Works Committee in 1979 which included detailed consideration of a full range of environmental issues. The fourth 500 kV line has been planned to use this approved southern easement consistent with power transfer requirements, segregation of the transmission lines from the Latrobe Valley for security purposes and at the most economic cost by maximum utilisation of existing 500 kV and 220 kV assets. The proposed use of the existing Coldstream to South Morang Easement for a section of the fourth 500 kV line is part of this overall easement planning.

Yours sincerely



I P Bates
ACTING CHIEF ENGINEER,
TRANSMISSION DEVELOPMENT

APPENDIX 4

Skyline Road,
KANGAROO GROUND. 3097.

2 June 1983.

The Secretary,
Natural Resources & Environment Committee,
100 Exhibition Street,
MELBOURNE. 3000.

Dear Sir,

re: Coldstream to South Morang 500 kV Line

Following the receipt this day of answers to my questions to the SEC on 28 April 1983, I would like to advise the Committee that I am not at all satisfied with the information and reasons that the SEC have given for the construction, by 1986, of the second Coldstream to South Morang 500 kV line.

My reasons are as follows -

1. The decision to take the Coldstream to Templestowe 500 kV line out of service until at least the fifth 500 kV line is constructed and required: This would probably be in at least 25 years or more if the 220 kV lines are progressively up-graded after 10 years (1993) as quoted in the SEC's answer to my question 1(a). As the Coldstream to Templestowe line is approximately 20 kilometres long, and based on \$470,000 per km (page 57 of the November 1982 SEC submission), this would mean a \$9 million asset would remain idle and depreciating for 25 years.

This appears to me to reflect a gross planning error in the SEC's long term plans "to scar the landscape with 500 kV power lines".

2. I disagree with the need to plan for the construction of a fourth 500 kV line from Hazelwood to Melbourne as soon as 1986, for the following reasons:
 - (a) In answer to 2(b) to my questions of 28 April 1983 the SEC stated that they are planning for a 250 MW demand from Alcoa at Portland in 1985/86. This should not be necessary as they say they have sufficient provision to supply Alcoa with power as required in October 1983, from the existing transmission network and generating plant. Therefore, these facilities should be sufficient to provide, if required, 250 MW in 1986 to the Alcoa

Portland smelter if it ever proceeds. (Unless Alcoa was to be supplied by running Jeeralang continuously - this point was made at the meeting on 31 May 1983).

- (b) The need to provide so much extra margin, if one 500 kV line is out of service and another 500 kV line fails. Over the past three years there has only been the one failure on 4 March 1983. From the information that I have been able to obtain, I believe the system could easily accommodate this sort of failure for a short period of one day.
 - (c) The 1981 SEC Annual Report stated that the Coldstream to South Morang line was due for construction in 1986. This date appears to have been retained. I doubt the accuracy of it in view of the following:
 - In the 1982 SEC Annual Report on Page 31, it was stated that "The main transmission line works will be adjusted to the delayed generation program and the Alcoa development at Portland".
 - In the long term electricity forecasts, the anticipated growth rate fell to 3.8%.
 - (d) In 1987/88, based on the SEC's inflated figures, the overall shortfall would only be 400 MW, if one line was out of service. Because of the points raised in (c) above, this shortfall would really be a surplus of 1100 MW.
3. Alternative means of connecting the fourth 500 kV line into the Metropolitan system should be given much closer investigation, because of the effect the Coldstream - South Morang line would have on -
- (a) The unique Environmental Living Zone.
 - (b) The chance of both 500 kV lines through the area failing when the bush fires come through the ELZ. The ELZ is situated in a very fire-prone area and residents are all prepared for when the fires next come through the area. We do not think the SEC will be like prepared if they place two lines through the area.
4. I have not been wholly convinced of the basis for costing of all of the SEC's alternative proposals and I would prefer to see the Committee obtain independent advice in this regard.

My main reasons for this are the following comments on costing of the Coldstream to South Morang second 500 kV line and the lack of costing for my alternative (a) below.

Page 31 of the 1983 SEC Annual Report refers to the Coldstream to South Morang line extending for 30.4 km i.e. at \$470,000 per km (Page 57, November 1982 Report). This is a cost of \$14.3 million and no cost is included for leaving the Coldstream to Templestowe line idle for 25 years. This would be equal to \$31.5 million in interest at 14% on \$9 million; a total cost more in the region of \$45 million.

The alternatives I favour are -

- (a) The up-grading of the Templestowe to Thomastown to Keilor line to 500 kV. At the meeting on 31 May 1983, this option was stated to be a simple possibility, as a large section of the line apparently has suitable towers to enable up-grading to 500 kV. I believed the SEC intended to give me full details of this option in writing today. After numerous phone calls to them today, I still could not obtain the information. This would diversify the termination of the 500 kV lines. Instead of directing the four 500 kV lines to South Morang, it would mean one would terminate at Keilor. This to me would be an excellent strategy to protect the system if South Morang was damaged by fire or lightning.
- (b) The termination of the fourth line at Templestowe and eventual establishment of the Templestowe and Coldstream Terminal Stations. I disagree that this option would only provide "breathing space" until 1989 or 1990 (Exhibit 6, page 2) because of my doubts about demand growth and flexibility in the transmission system. If the "breathing space" extended to 1993, the up-grading of the 220 kV lines in the central corridor could commence as they reached the end of their life (see SEC's reply to Question 1(a)). This up-grading would then replace the need for a separate fifth 500 kV line.
- (c) This alternative is based on development of the Narre Warren transformation station (Page 2, Exhibit 6). I find it difficult to comprehend that the insecurity which would arise would be any different to any other rare failure, especially when South Morang will still be served by two 500 kV lines on the Northern Easement. This option cost of \$35 million is far less than the \$45 million real cost for the South Morang - Coldstream line.

SUMMARY

I have found the time available, after the SEC makes any information available, ridiculously short. However, I appreciate the consideration the Committee has given me to query the planning of the SEC.

I would like to inform you of my personal viewpoint on the following two matters:

- (a) The eventual effect of the existing 500 kV line through the ELZ will be reduced in time, as I believe that when the existing line approaches the end of its life span alternative means of transmission will be available through advances in technology (cheaper undergrounding). These alternative transmission means will not, I hope, have such a severe impact on the environment.
- (b) I believe the Committee should investigate ways and means of having the SEC's long term planning improved and a proper energy conservation programme introduced into their planning approach. (This may be achieved if they were merged with the Gas & Fuel Corporation - similar to Western Australia).

The way the SEC has been producing alternative last minute alternatives which appear to be hastily costed, is a further indication of their lack of long term planning research.

Thank you for your consideration.

Yours sincerely,

(R. F. English)

APPENDIX 5



The Ministry
for Conservation

240 Victoria Parade,
East Melbourne, Victoria.

Telephone 6514011

Postal address: Box 41,
East Melbourne, Vic. 3002.

2/CEFD
22/4

Mr. E.C. Stokes,
Acting Chief Engineer,
Transmission Development,
State Electricity Commission,
Box 2765Y,
G.P.O.,
MELBOURNE, 3001.

22 APR 1983

Dear Mr. Stokes,

Thank you for your letter of 30 March 1983 concerning the proposed second Coldstream to South Morang 500,000 volt transmission line.

I have considered the material enclosed with your letter, and officers of the Ministry for Conservation have inspected the route and have held brief discussions with officers of the Melbourne and Metropolitan Board of Works and Upper Yarra Valley and Dandenong Ranges Authority. As a result I can now indicate that this proposal is one for which I consider an Environment Effects Statement should be prepared.

Consequently, I suggest that your Commission and the Ministry for Conservation discuss the content of an Environment Effects Statement. I note that the section of line over which the Environment Effects Statement is required would be the actual section to be duplicated, i.e. from a point approximately 4.5 km west of the proposed Coldstream Terminal Station. In addition, alternative routes should be examined, and the environmental effects of the proposed Coldstream Terminal Station addressed.

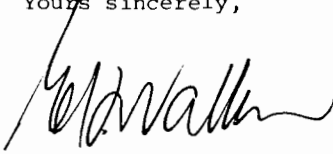
In commenting on the possible approval procedures put up by your Commission to the Natural Resources and Environment Committee, I would indicate that at this stage my preference is for assessment of the Environment Effects Statement by a panel appointed by me. The model for this is the Rosedale - Bairnsdale transmission line enquiry currently being examined by such a panel. A panel could have regard to planning matters, and my assessment would be provided to the Minister of Planning and other decision-makers after receipt of the panel's report.

I am hoping that the Natural Resources and Environment Committee will include in its recommendations an indication of the best method of catering for the requirements of all the responsible authorities involved in this exercise.

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I have forwarded a copy of this letter to the Secretary of the Natural Resources and Environment Committee.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Evan Walker". The signature is written in a cursive style with a long, sweeping underline that extends to the left.

EVAN WALKER,
MINISTER FOR CONSERVATION

APPENDIX 6

SUBMISSIONS RECEIVED

State Electricity Commission
Ministry for Conservation
Upper Yarra Valley and Dandenong Ranges Authority
Mr. R.F. English
Shire of Healesville
Bend of Islands Conservation Association
Conservation Council of Victoria
Shire of Eltham
Shire of Lillydale
Merri Yarra Municipal Protection Committee

APPENDIX 7

LIST OF WITNESSES

| | | |
|-------------------|---|---|
| Mr. I.P. Bates |) | |
| Mr. P.J. Wallace |) | |
| Mr. A.C. Spicer |) | Representing the State |
| Mr. H.G. Thorpe |) | Electricity Commission |
| Mr. R.G.W. Evans |) | |
| Dr. J.P. James |) | |
| Mr. R.F. English | | |
| Mrs. J. Mattiske | - | Representing the Bend of Islands Conservation Association |
| Mr. P. Machin | - | Representing the Shire of Healesville |
| Mr. G.N. Prattley | - | Representing the Upper Yarra Valley and Dandenong Ranges Authority |
| Mr. I. Cowdell | - | Representing the Ministry for Conservation |

