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Proposed high voltage electrical distribution upgrade, Liverpool Military Area, NSW

3.1 The Department of Defence (Defence) proposes to upgrade the electrical supply and distribution within the Liverpool Military Area (LMA), NSW. The proposed upgraded distribution network at Holsworthy Barracks will provide sufficient redundancy to support existing infrastructure as well as the planned additional facilities.

3.2 The purpose of the project is to upgrade the electrical supply and distribution infrastructure within the LMA, to ensure a stable and adequate supply to service growing demand.[1]

3.3 The cost of the project is $19.6 million, excluding GST.

3.4 This proposed construction project was referred to the Committee on 20 June 2012.

Conduct of the inquiry

3.5 Following referral, the inquiry was advertised in *The Australian* on 27 June 2012.

3.6 The Committee received one submission and two supplementary submissions from Defence, and two confidential supplementary submissions detailing the project costs. A list of submissions can be found at Appendix A.

3.7 The Committee received a private briefing and conducted a public hearing and an in-camera hearing on the project costs on 8 August 2012 in Sydney.

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1 Department of Defence (Defence), Submission 1, p. 14.

3.8 A transcript of the public hearing and the submissions to the inquiry are available on the Committee's website.[2]

Need for the works

3.9 The need for the project is as follows:

- blackouts are currently occurring at a rate of more than one per week due to deficiencies within the LMA electrical power supply system
- power requirements in the LMA are predicted to increase with future development
- if an electrical power supply is not secured, the LMA will not be able to support Defence capabilities.

3.10 Within Holsworthy Barracks, there has been an average of 1.72 power outages per week in 2012. This has increased from 0.94 per week in 2010 and 1.15 per week in 2011.[3]

3.11 Currently when a blackout occurs, the LMA has limited capacity to switch to local emergency generator systems to provide backup power supplies:

> … diesel powered generators, will kick in and provide power until power is restored. That is on the critical-capability elements. But the rest of the base is like the rest of the country: when the power goes out, you work in a blackout environment and you wait for it to come back on.[4]

3.12 Blackouts can be caused by outages within the LMA or in Endeavour Energy's system. The majority of outages are within the LMA network and are storm-related.[5]

3.13 This project will address blackouts caused by outages within the LMA by increasing redundancy in electrical infrastructure within the base. The project will not prevent blackouts due to outages in Endeavour Energy's system as it supplies all the power for the base through a single entry point.

3.14 The project will upgrade the electrical supply, connection and distribution system within the LMA to ensure that a stable and adequate electrical supply is available to service the growing demand to 2030.[6]

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2 <www.aph.gov.au/pwc>

3 Defence, Submission 1.3, p. 4.

4 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 4.

5 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 3.

3.15 However, Defence would still require backup diesel generators in the event of a blackout in Endeavour Energy's system. In the long-term, Defence is looking to provide redundancy in supply to the base to address this issue.[7]

3.16 Defence explained its estimated future electrical requirements within the LMA:

> Defence's overall demand for electrical power within the LMA is therefore forecast to grow to 28 MVA [mega volt amps] (with 8 MVA required for the new DNSDC [Defence National Storage and Distribution Centre] site at West Wattle Grove and 20 MVA required for Holsworthy Barracks). This includes allowances for the forecast demands for future projects and a 3.5 MVA reduction due to the vacation of the Moorebank sites as part of the DLTP [Defence Logistics Transformation Program] and MUR [Moorebank Units Relocation] projects. A 2 MVA increase for additional growth within Holsworthy Barracks out to 2030 has also been included.
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> Noting that the maximum electrical power supply that can be provided to Defence from its supplier is currently 13.5 MVA, this then leaves a deficit of 14.5 MVA, which if not provided through [this] project would result in the requirement for Defence to provide the additional supply through generators, similar in nature to a Central Emergency Power Station (CEPS).[8]

3.17 Defence stated what would occur if the project did not proceed:

> … essentially we are now at capacity in terms of the supply that we have coming into the base versus the demand that we are generating on the base. If this project were not to proceed then the new projects that we are looking to undertake on the base downstream will be without power, and as a result we would need to provide a temporary power solution, which would likely be in the form of generators. I am advised it could be in the vicinity of some $250,000 to $300,000 per month to provide the sort of level of power that we would expect.[9]

6 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 2.

7 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 4.

8 Defence, Submission 1.3, p. 3.

9 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 5.

3.18 Defence stated that there would be no immediate impact if the project did not proceed. However, proposed future works, development and growth within the LMA in the next four years would exceed the available power supply from Endeavour Energy and the existing connections.[10]

3.19 Defence confirmed that if the project did not proceed, it would severely restrict Defence's future plans, which are already in place and are a necessary part of defence planning.[11]

3.20 The Committee is satisfied that there is a need for the works.

Scope of the works

3.21 The project will deliver a new 33 kilovolts (kV) electrical supply to the LMA and improved electrical infrastructure within Holsworthy Barracks:

- construction of two Intake Switching Stations (ISS) that receive the electrical supply at 33 kV and house transformers to convert the supply to 11 kV and relevant equipment (switchgear) to control distribution of the electrical power within the base
- construction of an 11 kV interconnecting cable between the two ISS to provide redundancy within the electrical distribution system
- reconfiguration of the existing Holsworthy Barracks distribution system into seven separate ring mains to balance the load on each ring main and provide redundancy within the electrical distribution system
- design for the future installation of a Power Control and Monitoring Systems (PCMS) and Central Emergency Power Station (CEPS) to enable greater flexibility of electrical supply and the provision of emergency power to critical base assets.[12]

3.22 The majority of the current electrical distribution network is aboveground and prone to falling during storms. The new system has been designed to be belowground where possible.[13]

3.23 Defence confirmed that no new work will be undertaken aboveground, although some existing aboveground infrastructure will be used:

> Ring mains 1, 2, 3, 4 and 5 will all be underground. For ring main 6, which services the southern area, approximately half will be

10 Major M. Heggart, Defence, *transcript of evidence*, 8 August 2012, p. 5.
11 Major M. Heggart, Defence, *transcript of evidence*, 8 August 2012, p. 5.
12 Defence, Submission 1, p. 14.
13 Defence, Submission 1, p. 11.

> underground and half will be aboveground as part of the legacy. The majority of ring main 7 will be aboveground.[14]

3.24 Subject to Parliamentary approval, construction is planned to commence in January 2013 and be completed by mid-2014.

3.25 The Committee finds that the proposed scope of works is suitable to meet the need.

Options considered to meet the need

3.26 In determining the scope of the project, Defence considered various supply, connection and distribution options.

3.27 Defence stated that capability was the primary consideration when deciding how the project would deliver the objectives:

> Essentially the requirement for us to do this work at Holsworthy Barracks arises from a capability need of Defence. We have a requirement to ensure that we continue to maintain capability generated out of the Liverpool Military Area, and along with that comes the requirement to ensure an adequate and stable power supply. The assurance of capability was the driver behind the need for the works and it was also the driver behind confirming the solution that we are bringing to the committee.[15]

3.28 Defence provided a summary comparison of the options and costs of three proposed options to meet the need for the project:

- The 'recommended option', where supply is provided from the AVZSS [ANZAC Village Zone substation] along an existing 33 kV feeder, a 33 kV connection is made into Holsworthy Barracks and the existing electrical distribution is upgraded to seven rings mains (two of which are to be funded separately by the proposed MUR project) a majority of which will be underground, is estimated to result in a total cost of $21.1 million.
- A 'do nothing option', where the increased power supply to Holsworthy Barracks is met through the provision of hired generators and there is no upgrade to the electrical distribution system, is estimated to result in a total cost of $123.0 million.
- An 'outsource option' where all Defence owned electrical infrastructure within the LMA will be privatised and all

14 Mr M. Kavanagh, GHD, *transcript of evidence*, 8 August 2012, p. 6.

15 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, pp. 2-3.

> electrical power will be purchased at retail costs (as opposed to wholesale costs vide the recommended option) is estimated to result in a total cost of $58.5 million.[16]

3.29 Defence provided some detail on the supply options:

> Compounding the LMA electrical power supply issue, the current 11 kilo volt (kV) connection voltage within the LMA, although suitable for local distribution of loads is a highly inefficient voltage by which to transmit large electrical loads over the distances that exist within the LMA. As an example, the voltage loss across the existing five kilometre 11 kV supply cable is 4%, however with a 33 kV cable across the same distance there is only a 1% loss. Purchasing electrical power at 33 kV also attracts lower tariffs for Defence when compared to an 11 kV connection.[17]

3.30 Defence clarified why it chose the 33 kV supply option:

> Taking power at 11 [kV] was an option, but the additional feeders that would be required to link Holsworthy barracks with ANZAC Village Zone substation to take the 28 MVA that Defence requires was a significant cost and capability driver pushing Defence towards the 33 [kV] solution.[18]

3.31 Defence stated that a study was conducted into the cost-benefit into increasing the existing electrical infrastructure or replacing it. The outcome of this was that replacing the majority of the ring mains was the better option:

> It was decided for ring mains 1 through 5 that was the most cost-effective solution, and [for] part of ring main 6.
>
> Ring main 7 will make reuse of those existing Army feeders which will become redundant as part of this project. Ring main 7 will be reconfigured from Army feeders 1 and 2. I should also point out that the project is able to recover a significant quantity of materials for reuse. The intention is that the aerial cables and poles be recovered for use by Defence.[19]

3.32 Defence stated that outsourcing infrastructure ownership and maintenance to Endeavour Energy or another power company would have security implications. Each contractor, meter reader and electrical

16 Defence, Submission 1.3, pp. 7-8.

17 Defence, Submission 1.3, p. 3.

18 Mr M. Kavanagh, GHD, *transcript of evidence*, 8 August 2012, p. 6.

19 Mr M. Kavanagh, GHD, *transcript of evidence*, 8 August 2012, p. 7.

failure response worker who might need to access the LMA would require a security clearance:

> Each of those security clearances is a fair bit of work, but it could be done. But the bottom line is that access to our sites is difficult now, and it is becoming more so. Particularly on a site like Holsworthy, where we have some special operations capability, there are a number of sensitive sites there to which we would rather limit access.[20]

3.33 The Committee sought information on any disadvantages to the recommended option. Defence advised that there are some disadvantages:

- The main disadvantage with the recommended supply option is that there is no redundancy in supply. Endeavour Energy has advised that the supply risk on an above ground 33 kV feeder as per existing is '1 fault in 8 years'. Although this is a low failure rate, supply via one feeder does not provide a level of physical supply redundancy. However, the proposed delivery of a new Holsworthy Zone Sub Station by 2018 will provide Defence the opportunity to secure an additional 33 kV feeder at an estimated cost of $2.0 million (in 2012 terms). The addition of a second feeder from an alternate Zone Sub Station close to Holsworthy Barracks will provide Defence with a level of redundancy and will decrease the risk to supply from '1 fault in 8 years' to less than '1 fault in 20 years'.
- The main disadvantage with the recommended connection option is that there is a high initial capital cost to establish the two intake switching stations at Holsworthy Barracks, which will include transformers to convert the 33 kV supply to an 11 kV supply for distribution within Holsworthy Barracks. However, by adopting a 33 kV connection, Defence is increasing the efficiency of the supply through decreasing the resistance of the feeder that will supply power to Holsworthy Barracks.
- The main disadvantage with the recommended distribution option is that not all of the proposed new ring mains will be established underground, with parts of two of the seven ring mains remaining either partially or completely above ground. Although this represents a residual risk to the distribution of power to unit facilities located on these ring mains, this risk has been largely mitigated through the inclusion of the two intake

20 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 3.

> switching stations, their interconnection and the resultant ability for Defence to redirect power via multiple ring mains.[21]

3.34 However, Defence stated that the recommended option is the most cost-effective option for Defence:

> This cost effectiveness combined with the associated benefits of increased efficiency and an increased level of redundancy suggests that the recommended option provides a 'value for money' proposition.[22]

Cost of the works

3.35 The overall project cost is $19.6 million, excluding GST. The Committee received a confidential supplementary submission detailing the project costs and held an in-camera hearing with Defence on these costs.

3.36 The Committee notes that the value for money assessment it received following the in-camera hearing demonstrated that the chosen option not only provided the best outcome in terms of Defence capability, but was estimated to cost significantly less than other options considered.[23]

3.37 The Committee is satisfied that the costings for the project provided to it have been adequately assessed by the proponent agency.

Project issues

Adequacy of information provided

3.38 Defence provided the requisite Submission 1 to the Committee when the inquiry was referred. This submission provided some detail but was not comprehensive.

3.39 The Committee received a private briefing from Defence on 8 August 2012, immediately prior to the public and in camera hearings. This briefing was clear and provided comprehensive detail on the need for the project, the options considered and the scope of the works. This briefing also provided graphs and diagrams for key project concepts.

21 Defence, Submission 1.3, p. 5.

22 Defence, Submission 1.3, p. 8.

23 Defence, Submission 1.3, pp. 7-8.

3.40 Following the public and in camera hearings, the Committee requested further information on the need and the options considered. Defence provided additional supplementary submissions with this information.

Committee comment

3.41 While the need for the project may seem self-evident, it is a primary consideration for the Committee and should be clearly and logically stated in Submission 1. The scope of the works and the options considered should also be explained in detail.

3.42 Although the Committee was satisfied with the information it eventually received following the public and in camera hearings, this information should have been provided well prior to the date of the hearings.

3.43 In future, the Committee expects Defence to clearly state the need for the project in its initial submissions and during its opening statement at the public hearing. The Committee also expects Defence to provide comprehensive information on the scope of the works and the advantages and disadvantages of the options considered, in its initial submission.

3.44 Furthermore, all information provided at the briefing on 8 August 2012, including graphs and diagrams, should have been provided when the project was referred.

3.45 Without this information, the Committee is unable to make a determination regarding value for money.

3.46 The Committee recognises that Defence projects may have security considerations. However, the Committee reminds Defence that it can receive evidence confidentially.

3.47 The Committee expects Defence to rectify these issues in future projects.

Notifying elected representatives

3.48 Defence contacted the Liverpool City Council and the state Member for Menai to notify them of the project, offer a briefing and advise them of the date of the public community forum.

3.49 Defence did not, however, contact the local federal member, the Member for Hughes:

> It was our decision not to approach the federal member and I believe the reasoning for that was that it was […] a local project

> that happened entirely within the perimeter of Holsworthy Barracks.[24]

3.50 The Committee suggested that Defence write to the Member for Hughes to notify him of the project and offer a briefing.

3.51 Following the hearing, Defence reported that it had notified the local federal member of the proposed project and offered 'the opportunity to be provided with a detailed project briefing.'[25]

Committee comment

3.52 The Committee was at a loss to understand why Defence contacted some elected representatives but neglected to contact the federal member. As this is a federal parliamentary committee providing parliamentary scrutiny and the opportunity for public comment, it seems inconsistent for any agency to contact the local council and state member but neglect to contact the federal member.

3.53 The Committee suggests that for future projects, Defence write to all elected representatives with works in their electorates, to notify them of the project and offer a briefing.

Final Committee comment

3.54 The Committee found significant deficiencies in Defence's preparation of the initial submissions and presentation of information at the public hearing.

3.55 In contrast, Defence's private briefing on the day of the public hearing and supplementary submissions provided a level of detail that should have been included in the initial submissions.

3.56 The Committee needs this information well prior to the hearing date to allow it to adequately prepare for the public hearing and make a proper assessment of the project.

3.57 The Committee strongly encourages Defence to provide this level of detail in all initial submissions, particularly when discussing the need, scope and options considered.

3.58 The Committee previously made a recommendation to Defence on the importance of presenting information regarding options considered.[26] The

24 Brig. D. Naumann, Defence, *transcript of evidence*, 8 August 2012, p. 5.

25 Defence, Submission 1.3, p. 8.

Committee is disappointed that Defence did not provide this material in its initial submissions for this project.

3.59 The Committee reminds Defence that the provision of information in a clear, comprehensive and timely manner also allows the opportunity for public comment. This is an integral part of the Committee's inquiries into public works.

3.60 The Committee advises Defence to address the lapses in preparation apparent in this inquiry and ensure that evidence in future projects is presented in a clear, comprehensive and timely manner.

3.61 The Committee was satisfied with the evidence provided by Defence regarding the proposed high voltage electrical distribution upgrade in the Liverpool Military Area, NSW.

3.62 Having regard to its role and responsibilities contained in the *Public Works Committee Act 1969*, the Committee is of the view that this project signifies value for money for the Commonwealth and constitutes a project which is fit for purpose, having regard to the established need.

Recommendation 2

The Committee recommends that the House of Representatives resolve, pursuant to Section 18(7) of the *Public Works Committee Act 1969*, that it is expedient to carry out the following proposed work: Proposed high voltage electrical distribution upgrade, Liverpool Military Area, NSW.

26 *Report 4/2011*, Proposed Specific Nutritional Capability Project for Defence Science and Technology Organisation at Scottsdale, Tasmania, Recommendation 6: The Committee recommends that the Department of Defence provide full and complete details on all options considered for all future project proposals.
Available on the Committee's website: <www.aph.gov.au/pwc>