

# Regulatory Test Application for the Establishment of a new Shenton Park Zone Substation Submitted by Western Power

Issues Paper

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Economic Regulation Authority

WESTERN AUSTRALIA

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# 1 Introduction

On 10 July 2012, the Economic Regulatory Authority (**Authority**) received a major augmentation proposal from Western Power submitted under section 9.15 of the *Electricity Networks Access Code 2004 (Access Code)*.<sup>1</sup> The proposal comprises information required to be provided by Western Power in respect of the regulatory test under Chapter 9 of the Access Code for its proposed major augmentation – the establishment of a new Shenton Park zone substation. Western Power’s major augmentation proposal is available on the ERA’s website.<sup>2</sup>

As part of its assessment of Western Power’s major augmentation proposal, the Authority is undertaking consultation with interested parties as provided for under section 9.19 of the Access Code. The Authority has prepared this issues paper to help interested parties make submissions. In particular, the issues paper covers some of the significant issues to be addressed by the Authority in determining whether the regulatory test is satisfied, including:

- the requirements of the regulatory test under Chapter 9 of the Access Code;
- key aspects of the proposed major augmentation;
- Western Power’s public consultation process;
- the identification of alternative options; and
- the assessment of net benefits of the proposed major augmentation and alternative options.

## 2 The Regulatory Test

Chapter 9 of the Access Code establishes the regulatory test that is applied to proposals for major augmentations of a covered network. In general terms, the regulatory test is intended to prevent a service provider from committing to a major augmentation of its network until it has been determined that the requirements of the regulatory test have been satisfied.

Specifically, the regulatory test is defined in section 9.3 of the Access Code as “an assessment under Chapter 9 of whether a proposed major augmentation to a covered network maximises the net benefit after considering alternative options”.

### Purpose of the Regulatory Test

The purpose of the regulatory test is to determine whether a proposed major augmentation to an electricity transmission and/or distribution network is the best way of overcoming constraints in the wider electricity system, taking into account alternative means of overcoming the constraints, such as, alternative network investments, investment in generation or the management of electricity demand.

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<sup>1</sup> Western Power, July 2012, Submission to the Economic Regulation Authority Major Augmentation Proposal Establish New Shenton Park Zone Substation (hereafter referred to as “**major augmentation proposal**”).

<sup>2</sup> Economic Regulation Authority website:  
[http://www.erawa.com.au/3/1218/48/shenton\\_park\\_zone\\_substation\\_augmentation – regula.pm](http://www.erawa.com.au/3/1218/48/shenton_park_zone_substation_augmentation_-_regula.pm)

The regulatory test is applicable only to “major augmentations”; defined in section 1.3 of the Access Code:<sup>3</sup>

- 1.3 “major augmentation” means an augmentation for which the new facilities investment for the shared assets:
- (a) exceeds \$10 million (CPI adjusted), where the network assets comprising the augmentation are, or are to be, part of a distribution system; and
  - (b) exceeds \$30 million (CPI adjusted), where the network assets comprising the augmentation are, or are to be, part of:
    - (i) a transmission system; or
    - (ii) both a distribution system and a transmission system.

A service provider must not commit a major augmentation before the Authority determines, or is deemed to determine, that the regulatory test is satisfied.

### Regulatory Test Process

The process of the regulatory test commences with the service provider submitting a “major augmentation proposal” to the Authority. This may occur either:

- under section 9.10 of the Access Code, with the major augmentation proposal submitted as part of a proposed access arrangement, and the Authority’s determination of whether the regulatory test is satisfied forming part of the Authority’s decision on the proposed access arrangement; or
- under section 9.15 of the Access Code, with a major augmentation proposal submitted other than as part of a proposed access arrangement and the Authority’s determination on whether the regulatory test is satisfied being a determination separate from the approval proposal for a proposed access arrangement.

Western Power’s major augmentation proposal for the establishment of a new Shenton Park zone substation, which is the subject of this issues paper, has been submitted under the second of these two processes.

Section 9.16 of the Access Code establishes the requirements for a major augmentation proposal submitted to the Authority other than as part of a proposed access arrangement:

- 9.16 A major augmentation proposal submitted under section 9.15:
- (a) must describe in detail each major augmentation to which the major augmentation proposal relates; and
  - (b) must state that, in the service provider’s view, each proposed major augmentation maximises the net benefit after considering alternative options; and
  - (c) must demonstrate that the service provider has conducted a consultation process in respect of each proposed major augmentation which:
    - (i) included public consultation under Appendix 7; and
    - (ii) gave all interested persons a reasonable opportunity to state their views and to propose alternative options to the proposed major augmentations, and that the service provider had regard to those views and alternative options; and

<sup>3</sup>2012 CPI adjusted amounts are: a) 11.1 million and b) 33.2 million as published in the Consumer Price Index Adjustment Notice by the ERA, 30 May 2012, [http://www.erawa.com.au/2/306/48/electricity\\_access\\_electricity\\_networks\\_access\\_co.pm](http://www.erawa.com.au/2/306/48/electricity_access_electricity_networks_access_co.pm)

- (iii) involved the service provider giving reasonable consideration to any information obtained under sections 9.16(c)(i) and 9.16(c)(ii) when forming its view under section 9.16(b);

and

- (d) must comply with the current requirements published under section 9.17 [and]
- (e) may include a request that the Authority give prior approval under section 6.72 in respect of the new facilities investment for one or more proposed major augmentations.

“Alternative options” and “net benefit”, referred to in section 9.16(b), are defined under Chapter 1 of the Code:

- 1.3 “alternative options”, in relation to a major augmentation, means alternatives to part or all of the major augmentation, including demand-side management and generation solutions (such as distributed generation), either instead of or in combination with network augmentation.

...

“net benefit” means a net benefit (measured in present value terms to the extent possible) to those who generate, transport and consume electricity in (as the case may be):

- (a) the covered network; or
- (b) the covered network and any interconnected system.

### **Satisfying the Regulatory Test**

For a major augmentation proposal submitted to the Authority other than as part of a proposed access arrangement, the requirements for satisfying the regulatory test are set out in section 9.20 of the Access Code.

- 9.20 The test in this section 9.20 is satisfied if the Authority is satisfied that:
    - (a) the service provider’s statement under section 9.16(b) is defensible; and
    - (b) the service provider has applied the regulatory test properly to each proposed major augmentation:
      - (i) using reasonable market development scenarios which incorporate varying levels of demand growth at relevant places; and
      - (ii) using reasonable timings, and testing alternative timings, for project commissioning dates and construction timetables for the major augmentation and for alternative options;
- and
- (c) the consultation process conducted by the service provider meets the criteria in section 9.16(c).

### **Regulatory Test Assessment**

Section 9.18 of the Access Code establishes the timeframes for a determination by the Authority on whether the regulatory test is satisfied or not satisfied:

- 9.18 The Authority must in respect of a major augmentation proposal submitted under section 9.15 make and publish a determination whether the test in section 9.20 is satisfied or not satisfied, and must do so:
  - (a) if the Authority has consulted the public under section 9.19 – within 45 business days; and
  - (b) otherwise – within 25 business days,

after receiving the augmentation proposal.

If the Authority has not made a determination within the time limits under section 9.18 of the Access Code, the Authority is deemed, under section 9.22 of the Access Code, to have determined that the regulatory test is satisfied.

The role of the Authority is to consider the information provided by a service provider in the major augmentation proposal and to determine whether the regulatory test set out in section 9.20 of the Access Code is satisfied. Section 9.21 of the Access Code places the onus on the service provider to demonstrate that the regulatory test is satisfied.

- 9.21 If the Authority is unable to determine whether the test set out in section 9.20 is satisfied or is not satisfied because the service provider has not provided adequate information (despite the Authority having notified the service provider of this fact and given the service provider a reasonable opportunity, having regard to the time periods specified in section 9.18, to provide adequate information), then the Authority may determine that the test in section 9.20 is not satisfied.

The Authority's role ends with the determination of whether the regulatory test is satisfied or not satisfied. If the latter determination is made, the Authority does not have a role to remedy any deficiency in the major augmentation proposal or to make any determination on the alternative option that may maximise net benefits.

## 3 Western Power's Proposed Major Augmentation

### 3.1 Reasons for Proposed Augmentation

In considering the investment requirements for the Shenton Park Zone Substation, Western Power has assessed the potential long term development of the whole of the western suburbs over a 25 year period.

Western Power's submission states that the two key drivers for the major augmentation are that:

- the existing 66 kV equipment (lines and substations) are progressively reaching the end of their economic and technical lives.
- the western suburbs have an underlying load growth that can no longer be sustained by the current network of 66 kV lines and zone substations; and

Western Power believes it is essential to address these two issues and also notes the proposed augmentation has the benefit of providing synergies with the QE2 hospital substation upgrade.

Further details on the key drivers for the major augmentation can be found in Western Power's major augmentation proposal on pages 6-7 and in Western Power's options paper on pages 6-13.

## 3.2 Proposed Major Augmentation

Western Power's regulatory test application is for a new 132kV/11kV zone substation on land adjacent to the existing substation at Shenton Park. The new substation will contain two 75MVA 132/11kV transformers and two line circuits. The Shenton Park distribution network and the Herdsman Parade zone substation distribution network will be converted and upgraded from 6.6 kV to 11 kV.

As a result of the augmentation and other associated projects, the existing 66kV/6.6kV Shenton Park zone substation will be decommissioned in the years to follow, along with other western suburb zone substations including those at Herdsman Parade and the University.

Further details on the options considered for the major augmentation can be found in Western Power's major augmentation proposal on pages 8-10 and in Western Power's options paper on pages 14-22.

## 3.3 Requirements of the Access Code

The requirements for Western Power to undertake public consultation on the major augmentation proposal are set out in section 9.16(c) of the Code:

9.16 A major augmentation proposal submitted under section 9.15:

...

- (c) must demonstrate that the service provider has conducted a consultation process in respect of each proposed major augmentation which:
  - (i) included public consultation under Appendix 7; and
  - (ii) gave all interested persons a reasonable opportunity to state their views and to propose alternative options to the proposed major augmentations, and that the service provider had regard to those views and alternative options; and
  - (iii) involved the service provider giving reasonable consideration to any information obtained under sections 9.16(c)(i) and 9.16(c)(ii) when forming its view under section 9.16(b);

...

Appendix 7 of the Access Code establishes the following requirements on Western Power in undertaking consultation on the major augmentation proposal:

- publication of an invitation for submissions (section A7.6 of the Access Code);
- specification of the length of time allowed for the making of submissions that must be at least 10 business days and no greater than 20 business days (sections A7.7 and A7.9 of the Access Code); and
- publication of submissions received (section A7.20 of the Access Code).

Appendix 7 also allows, but does not require, Western Power to:

- produce and publish an issues paper examining the issues relating to the major augmentation proposal (section A7.4 of the Access Code); and
- consider any submissions made after the time for making that submission has expired (section A7.21 of the Access Code).



## 3.4 Consultation undertaken by Western Power

Western Power conducted a two stage public consultation process.<sup>4</sup> A discussion (options) paper outlining a background of the existing substation, electricity demand, forecast reliability of supply requirements and detailing the options considered for the project was published in January 2012. Submissions relating to this discussion paper were invited, with the closing date for submissions specified as 10 April 2012.

In addition two industry and community forums were held on 27 March 2012, during the public consultation period, at the Hollywood Bowling Club in Nedlands to provide further details to key stakeholders and allow for feedback on the proposal.

Submissions are invited from interested parties on whether Western Power:

- gave all interested parties a reasonable opportunity to state their views on the major augmentation proposal and to propose alternative options; and
- had adequate regard to the views and alternative options that were submitted.

## 4 Identification of Alternative Options

### 4.1 Requirements of the Access Code

Under section 9.16(b) of the Access Code, Western Power is required to have considered alternative options to the proposed transmission line. “Alternative options” is defined under Chapter 1 of the Code:

“alternative options”, in relation to a major augmentation, means alternatives to part or all of the major augmentation, including demand-side management and generation solutions (such as distributed generation), either instead of or in combination with network augmentation.

### 4.2 Alternative Options Identified by Western Power

Western Power considered a range of network and non-network alternatives.<sup>5</sup> However, non-network solutions were not pursued by Western Power. Western Power considers load growth could potentially be addressed through non-network solutions but the requirement to replace the assets due to their age and current condition could not be alleviated by these means. Western Power’s submission states that it will “continue to investigate non-network solutions as an integral part of its network planning and development process”.<sup>6</sup>

- Network solutions included:
  - Option 1 - Retain 66 kV and upgrade network capacity;

<sup>4</sup> Western Power, Major augmentation proposal, page 4.

<sup>5</sup> Western Power, Major augmentation proposal, page 9.

<sup>6</sup> Western Power, Major augmentation proposal, page 9.

- Option 2 - Shenton Park substation upgraded to 132/11 kV, Herdsman Parade substation load transferred to Shenton Park and Herdsman Parade decommissioned;
- Option 3 - Shenton Park & Medical Centre substations upgraded to 132/11 kV, Herdsman Parade load transferred to Shenton Park, University load transferred to Medical Centre, Herdsman Parade & University substations decommissioned;
- Option 4 - Full 132 kV migration of Shenton Park, Medical Centre, Wembley Downs & Nedlands substations with Herdsman Parade & University substations decommissioned.

The work required for the proposed Shenton Park zone substation varies dependant on which of the above options is chosen.

The requirements for the zone substation for each of the above options are as follows:

- Option 1 – 3 x 35 MVA 66/11 kV transformers
- Option 2 – 2 x 75 MVA 132/11 kV transformers (dual winding 75 MVA)
- Options 3 or 4 – 2 x 75 MVA 132/11 kV transformers (dual winding 75 MVA) with provision for two additional 132 kV feeders

Western Power's proposed augmentation is based on Option 3.

Submissions are invited from interested parties on whether Western Power has:

- identified a relevant set of alternative options to the proposed augmentation; and
- the appropriateness of considering alternative options for the Shenton Park zone substation major augmentation based on long term network augmentation options for the wider western suburbs region in Perth.

## 5 Assessment of Net Benefits

### 5.1 Western Power's Submission

As noted above the viable options considered for the Shenton Park zone substation major augmentation have all been considered as part of the assessment of potential long-term development strategies for the western suburbs over a 25 year period.

Western Power believes that, with the expected level of asset replacement and forecast network capacity limitations over the 25 year strategy period, there is a significant opportunity to implement an optimal transmission system design for the whole Western Suburbs region area, rather than just considering like-for-like asset replacements or assets with marginally increased thermal capacity for individual assets within the region.

## 5.2 Financial Considerations

All the development options proposed have been evaluated on a Net Present Cost (NPC) basis by Western Power over a 25 year period as shown in a reproduction of Western Power's "2035 Financial Characteristics" table below.<sup>7</sup>

The table also shows the estimated remaining transmission capacity (measured in MVA) at the end of the 25 year review period (year 2035) and divides the NPC by the remaining transmission MVA at 2035 to give a cost of the remaining transmission MVA in present value terms.

**Table 5.1**      **Reproduction of Western Power's "2035 Financial Characteristics" table**

Option	Description	Net Present Cost (\$M)	Remaining Transmission MVA at 2035	\$M (NPC) / MVA at 2035
1	Retain 66 kV and upgrade network capacity	117.7	42	2.80
2	Shenton Park Upgraded to 132 kV with Herdsman Parade decommissioned.	114.8	92	1.25
3	Shenton Park & Medical Centre Upgraded to 132 kV with Herdsman Parade & University decommissioned.	112.1	107	1.05
4	Full 132 kV Migration of Shenton Park, Medical Centre, Wembley Downs & Nedlands with Herdsman Parade & University decommissioned.	119.4	117	1.02

Notes:                      Discount rate is the approved weighted average cost of capital for the AA2 period (i.e. 7.98%, real pre-tax)  
                                     Net Present Cost (NPC) period is 2010-2035

Western Power has also undertaken sensitivity analysis on its cost and demand growth estimates and considered other factors such as electrical losses, differences in operating costs, sale and remediation of decommissioned substation sites and other technical issues.<sup>8</sup> As a result, Western Power considers that Option 3 maximises the net benefits when considering alternative options. Western Power has also provided a comparison of the advantages and disadvantages of Strategy 3 and 4 in its Options Paper at page 32.

The investment requirements for the Shenton Park zone substation major augmentation, for each option are reproduced below from Western Power's major augmentation proposal.<sup>9</sup>

<sup>7</sup> Western Power, Major augmentation proposal, page 10.

<sup>8</sup> Western Power, January 2012, Options Paper, Establish New Shenton Park Zone Substation, pages 26-30.

<sup>9</sup> Western Power, Major augmentation proposal page 10.

**Table 5.2      Reproduction of Western Power’s “Shenton Park Network Option Costs” table**

Option	Proposed Augmentation	Cost, \$M (nominal 2010)
1	New Zone Substation at existing site with 3 x 35 MVA 66/11 kV transformers	17.89
2	New Zone Substation at existing site with 2 x 75 MVA 132/11 kV transformers (dual winding 75 MVA)	23.29
3 & 4	New Zone Substation at existing site with 2 x 75 MVA 132/11 kV transformers (dual winding 75 MVA) with provision for two additional 132 kV feeders	26.03

Notes:                      Discount rate is the approved weighted average cost of capital for the AA2 period (i.e. 7.98%, real pre-tax).

Although the NPC for Option 3 (as shown in Table 5.1) is the lowest, the costs in relation to the new zone substation at Shenton Park are the highest.

Submissions are invited from interested parties on whether:

- the method adopted by Western Power of considering the preferred option based on long term options for the wider area of the western suburbs in Perth are consistent with good industry practice and appropriate for determining the Shenton Park zone substation major augmentation; and
- Western Power has adequately identified all of the Net Benefits of each of the proposed options.

### 5.3 Western Power’s Recommendation

Western Power has recommended that Option 3 is the preferred option for the augmentation.

*“Strategy 3 is the recommended option as it meets all the required technical performance standards whilst minimising the present value costs across the 25 year period, as outlined in Table 2 below. Whilst being the lowest cost option, it also provides significant remaining transformer capacity at the end of the study period, which is 2035.”<sup>10</sup>*

Submissions are invited from interested parties on whether the preferred option selected by Western Power maximises the net benefit for the network after considering alternative options.

<sup>10</sup> Western Power, Major augmentation proposal page 9.