Revised Regulatory Proposal

Supporting Information: Geilston Bay Conductor Augmentation Project (Section 10.4.1, Capacity Management Plan 2011)

Aurora response to the AER's Draft Distribution Determination

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1. Introduction

Aurora provided the AER with its *Regulatory Proposal* on 31 May 2011 in accordance with the provisions of Chapter 6 of the *Rules*. Aurora also set out its answers to the Regulatory Information Notice (RIN) issued by the AER on 21 April 2011 in its response (*RIN Response*) of 31 May 2011.

The AER has reviewed Aurora's *Regulatory Proposal* and *RIN Response* and provided Aurora with the AER's *Draft Distribution Determination*, associated consultant's reports and AER models on 29 November 2011 in accordance with the provisions of Chapter 6 of the *Rules*.

Aurora provides its *Revised Regulatory Proposal* to the AER in response to the AER's *Draft Distribution Determination* in accordance with the provisions of Chapter 6 of the *Rules*. This document provides specific supporting information as an appended attachment to Aurora's *Revised Regulatory Proposal*

2. Background

Geilston Bay Zone Substation supplies the Geilston Bay, Risdon Vale, Otago, Risdon, Lindisfarne and Rose Bay areas on the Eastern Shore of Hobart. The load on Geilston Bay is currently in excess of firm capacity. In addition, one of the feeders, number 26167, is presently loaded beyond its planning rating, with the loading forecast to increase every year into the future.

Given the age of the transformers in the Zone Substation, Aurecon recommended that Aurora look to undertaking replacement in 2013/14, with replacement contingent upon transformer condition, at an expected cost of $4 million.[1] Aurecon had also suggested the construction of a new feeder from Geilston Bay Zone Substation to take some of the load on the existing, overloaded feeder 26167.[2]

Aurora recognised that the unloading of feeder 26167 in conjunction with the future load transfer to the new Rosny Zone Substation may extend the life of the existing transformers by allowing them to operate at under their firm capacity. That is, the construction of the new feeder can potentially defer the need to replace two Zone Substation transformers until beyond the end of the *forthcoming Regulatory Control Period*.

In its *Regulatory Proposal*, Aurora forecast capex of approximately $0.25 million for the construction of the new feeder. The AER's Principle Technical Advisor, Nuttall Consulting, considered that, after taking into account the effect of the AER's demand forecasts, only 33 per cent of the project cost was related to addressing demand-related issues. The AER, in the *Draft Distribution Determination*, used this value in their substituted capex forecast.

Aurora considers that the AER and Nuttall Consulting have inappropriately substituted the forecast capex for the network component of the project.

[1] Aurecon Report, page 21
[2] Aurecon Report, page 48

3. Regulatory Proposal

In its *Regulatory Proposal*, Aurora forecast capex of approximately $0.25 million (June $2010) for the design and construction of a new feeder from the Geilston Bay Zone Substation. This new feeder was intended to interconnect with the area's existing 11 kV network to remove load from feeder 26167 and improve load shifting capability in the area.

This capex forecast was supported by the following attachments to the *Regulatory Proposal* and the accompanying RIN:

- *System Strategic Planning Capacity Report – Hobart East, 2010*, produced by Aurecon for Aurora, which was attachment AE046 to Aurora's *Regulatory Proposal* (the Aurecon Report); and
- the *Hobart East Development Plan*, which incorporates the findings of the Aurecon Report, was submitted to the AER as an attachment to Aurora's RIN.

4. Draft Distribution Determination

The AER's Principle Technical Consultant, Nuttall Consulting, reviewed Aurora's forecast capex and project documentation for the Geilston Bay Conductor Augmentation project.

Nuttall Consulting considered that the timing and scope of this project "appears to be reasonably justified".[3] Nuttall Consulting further noted:

> *The response indicates that the need for this project is to address the overloading of a feeder supplied from Geilston Bay (26167), which primarily supplied critical loads. It also states that the proposed project, a new feeder, will improve the transfer capability in that area, which is presently limited due to the neighbouring network operating at a different voltage level.*
>
> *The loading spreadsheet indicates that the feeder is presently over its planning rating, even allowing for the conservatism in Aurora's analysis, noted above. Given the timing is set for 2016/17, it is not clear how Aurora is intending to manage this issue to this time. Nonetheless, there seems a high likelihood that some project will be justified at the proposed time. That said, given the existing load management issues, it seems reasonable to assume that the project would result in some modest improvement in opex and reliability.*[4]

In light of this analysis, Nuttall Consulting formed the view that 10 per cent of the capex for the Geilston Bay conductor augmentation project was directed towards non-demand-related benefits, and suggested that a value of 90 per cent of the Aurora proposal be used as a substitute capex forecast.[5]

Nuttall Consulting then considered the effect of the AER's own demand forecasts:

> *The AER forecast still results in the feeder being above its planning rating at the commencement of the next period, in line with the Aurora forecast. However, the AER is forecasting a much lower growth rate (0.25% compared 2.73%). As such, the maximum demand will be much lower than assumed by Aurora at the time of the augmentation proposed by Aurora, which is near the end of the period. As such, it seems reasonable to assume that the project could be deferred out of the next period.*[6]

In consequence, Nuttall Consulting revised their estimate, considering that 33 per cent of Aurora's forecast capex was demand-related.

The AER accepted this view[7], and subsequently substituted a revised capex forecast of 33 per cent of Aurora's forecast capex, which value was used in the aggregate substitute capex forecast.[8]

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[3] Nuttall Consulting Capex Report, page 43
[4] Nuttall Consulting Capex Report, page 170
[5] Nuttall Consulting Capex Report, page 56
[6] Nuttall Consulting Capex Report, page 61
[7] Draft Distribution Determination, page 142
[8] AER spreadsheet *AER Capex Analysis – to Aurora*, worksheet *timing review – ex OH*)

5. Revised Regulatory Proposal

Aurora considers that the AER has erred in substituting a value $^2/_3$ of the original forecast capex for the Geilston Bay Conductor Augmentation Project.

In performing their review of the project, Nuttall Consulting suggested that only ninety per cent of the Geilston Bay Conductor Augmentation Project is demand related. Information provided to Nuttall Consulting, however, quite clearly indicated that the feeder was already experiencing loading in excess of its planning limits, which fact was acknowledged by Nuttall Consulting:

> *The loading spreadsheet indicates that the feeder is presently over its planning rating, even allowing for the conservatism in Aurora's analysis.*[9]

The suggestion that followed, that, when the AER's forecast demand increase rates are considered, the demand-related portion of expenditure would drop to 33 per cent is a non sequitur.[10] The feeder is already overloaded. Irrespective of the differing rates of increase between the AER's and Aurora's forecasts, the feeder will continue to be overloaded. Further, because both demand forecasts show positive rates of change, the feeder only will become more overloaded as time passes.

Aurora notes that this particular project, with a forecast capex of $0.25 million potentially defers the requirement to spend $4 million to replace two distribution transformers.

Aurora contends that:

- the full amount of the Geilston Bay Conductor Augmentation Project is required to address demand issues; and
- the AER's demand forecast has no bearing on the timing of the project because the feeder is already overloaded.

Aurora has provided a description of the Geilston Bay Conductor Augmentation Project in section 8.

[9] Nuttall Consulting Capex Report, page 170
[10] Nuttall Consulting Capex Report, page 61

6. References

- *System Strategic Planning Capacity Report – Hobart East, 2010*, produced by Aurecon for Aurora, which was attachment AE046 to Aurora's *Regulatory Proposal* (the Aurecon Report); and
- the *Hobart East Development Plan*, which incorporates the findings of the Aurecon Report, was submitted to the AER as an attachment to Aurora's RIN.

7. Confidentiality

Aurora does not consider any information contained within this document to be confidential.

8. Appendix: Geilston Bay Conductor Augmentation Project

8.1. Description of Geilston Bay Zone Substation

Geilston Bay Zone Substation was constructed in 1964 to address the distribution load in the Geilston Bay, Risdon Vale, Otago, Risdon, Lindisfarne and Rose Bay areas on the Eastern Shore of Hobart.

The Zone Substation is fed from Transend's Lindisfarne Terminal Substation by two 33 kV sub-transmission feeders, each of 28.5 MVA rating and the substation itself contains two 22.5 MVA 33/11 kV transformers, giving a substation firm capacity of 22.5 MVA.[11] The substation supplies eight 11 kV distribution feeders, with two spare circuit breakers, and space for, potentially, two extra circuit breakers, should the need arise.

The load on Geilston Bay is currently in excess of firm capacity (see section 9.1 for more details), although the construction of the Rosny Zone Substation will permit 11 MVA of this load to be transferred.[12]

At the present time, feeder 26167 is loaded beyond its planning rating of 5 MVA (see section 9.2 for more information), with the loading forecast to be 5.8 MVA in 2012, and increasing by around 0.1 MVA per annum until past 2017. Additionally, the loading on feeder 26162 is forecast to exceed its planning rating in 2016.[13]

8.2. Conductor Augmentation Project Description

Given the age of the transformers, Aurecon recommended that Aurora look to undertaking replacement in 2013/14, with replacement contingent upon transformer condition. Aurecon suggested that the two existing transformers be replaced with two 25 MVA units, which would provide a substation firm capacity of 25 MVA, at an expected cost of $4 million.[14]

Aurecon had suggested the construction of a new feeder from Geilston Bay Zone Substation to take some of the load on the existing, overloaded feeder 26167.[15]

Aurora recognised that the unloading of feeder 26167 in conjunction with the future load transfer to the new Rosny Zone Substation would extend the life of the existing transformers by allowing them to operate at under their firm capacity. That is, the construction of the new feeder would potentially defer the need to replace two Zone Substation transformers until beyond the end of the *Forthcoming Regulatory Control Period*.

[11] Aurecon Report, page 15
[12] Aurecon Report, page 11
[13] Aurecon Report, page 47
[14] Aurecon Report, page 21
[15] Aurecon Report, page 48

8.3. Conductor Augmentation Project Timing

Aurora provided an indication of the timing of the new feeder in its program of work that was provided to the AER as attachment AE083 to the *Regulatory Proposal*.

There are two line items associated with this project:

- one for design costs associated, planned for 2013/14; and
- one for the actual construction of the feeder, shown in the program of work as for 2016/17.

Customarily, Aurora constructs infrastructure in the same year as the infrastructure is designed. Accordingly, given the date proposed for the design of the new feeder infrastructure and the already overloaded nature of the feeder that the new infrastructure is intended to address, Aurora considers that the 2016/17 construction date is an error, and should be 2013/14.

Aurora acknowledges an oversight in the timing of the construction of the new feeder.

9. Appendix: Geilston Bay Zone Substation Constraints

9.1. Zone Substation Loading

The draft 2011 load forecast, which was not available when the *Regulatory Proposal* was submitted in May 2011, shows that the loading on Geilston Bay Zone Substation exceeds both its continuous planning rating (22.5 MVA) and emergency rating (25 MVA). Figure 1 shows the historical and forecast loading of Geilston Bay Zone Substation for the years 2007 to 2021.

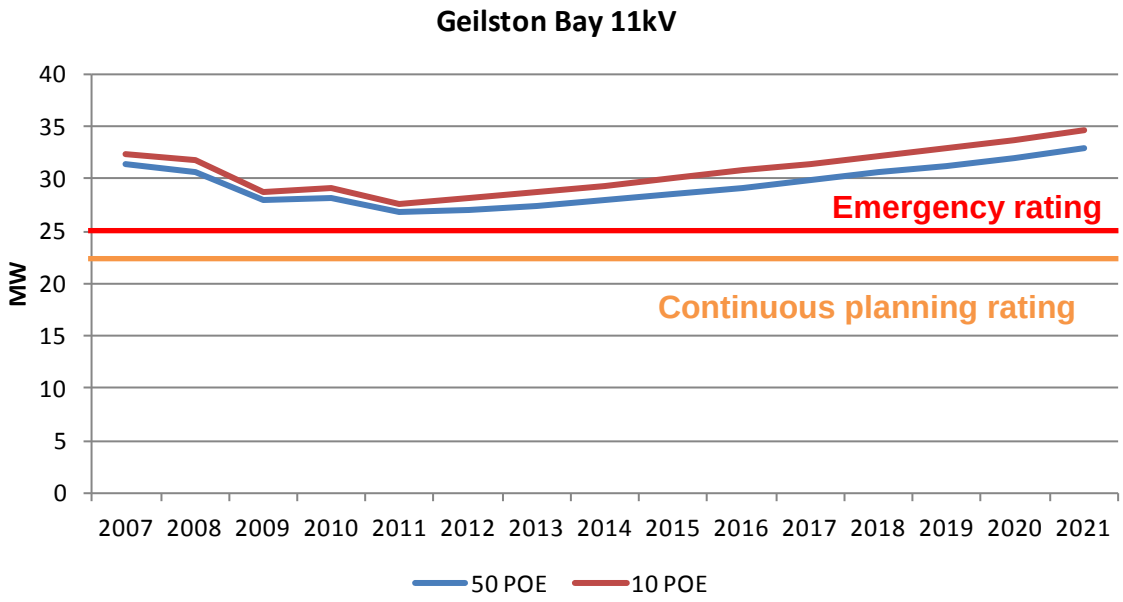
9.2. Geilston Bay Feeder 26167 Loading

Historical feeder loading data extracted from Aurora's Feeder Loading Reporting System for Geilston Bay feeder 26167 for the period 3 December 2007 to 3 January 2012 is presented in Figure 2. Note the periodic nature of the loading, with the maxima occurring in the winter months.

The feeder tail cabling has a planning rating of 260 A which has been consistently overloaded during winter months 2007. Even the relatively mild winters of 2010 and 2011 have still resulted in loading of around 260 A, with periodic excursions above that level. If left in its current state, this capacity constraint carries a high risk of failure with an inherent reliability risk.

Further analysis, indicates that 10.2 MWh of load has been in excess of the 260 A planning rating since 2007, an average of 2.3 MWh per year.

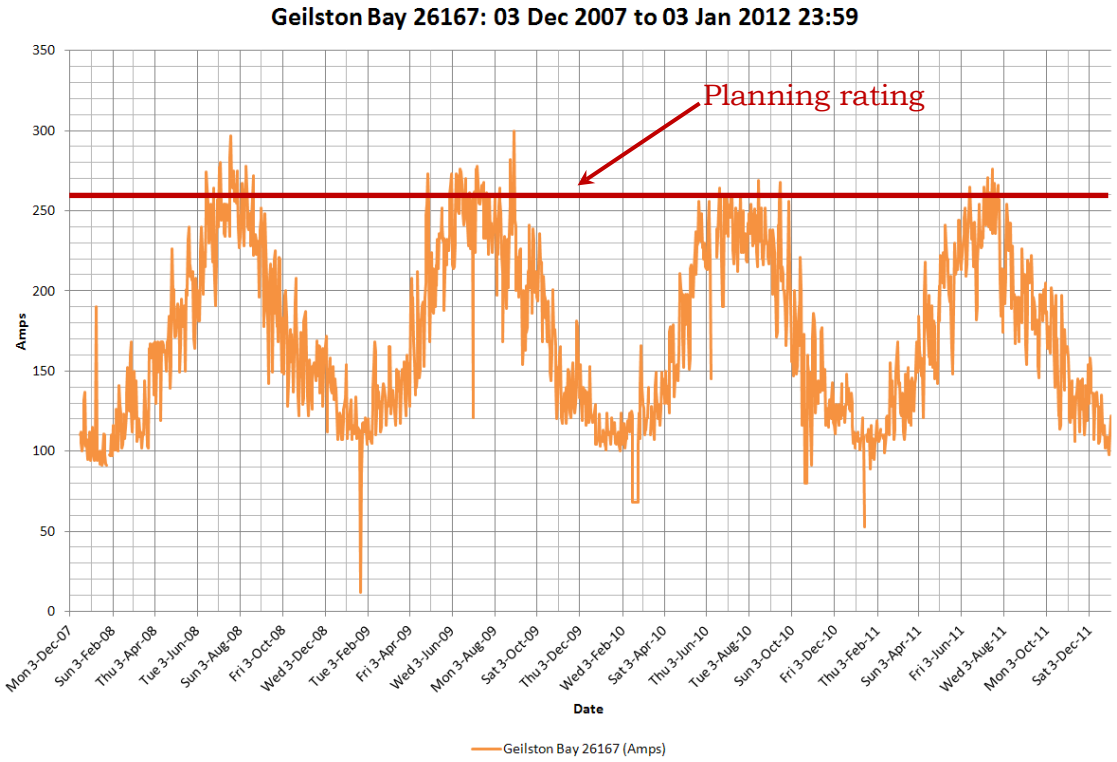
Figure 1. Geilston Bay Zone Substation – Historical and Forecast Loading



Regardless of which demand growth rate is used, Aurora's growth rate used in the *Regulatory Proposal*, the AER's revised growth rate used in the *Draft Distribution Determination*, or the revised ACIL Tasman rate, this feeder is overloaded.

It should also be noted that the potential for load transfers to adjacent Geilston Bay Zone Substation feeders has already been exhausted. Even so, load transfers do not alleviate the total loading on the Zone Substation, which is above its firm rating.

Figure 2. Loading on Geilston Bay Feeder 26167 - December 2007 to January 2012



10. Glossary of Terms Used in This Document

A	Amps
AER	Australian Energy Regulator
Aurecon Report	*System Strategic Planning Capacity Report – Hobart East, 2010*, produced by Aurecon for Aurora, attachment AE046 to Aurora's *Regulatory Proposal*
Futura Report	*Identification of Non-network Initiatives for the 2012-17 EDPR* produced for Aurora by Futura Consulting in July 2010, attachment AE055 to Aurora's *Regulatory Proposal*
kV	KiloVolt
MVA	MegaVolt-Amps
RIN	Regulatory Information Notice
MWh	MegaWatt-hours