Revised Regulatory Proposal

Supporting Information: Replace EDO Fuse Tube Replacement (fire mitigation) (SIFIF)

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 have 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. Replace EDO Fuse Tube Replacement (Fire Mitigation) (SIFIF)

2.1. Summary

In Aurora's Pricing Submission, Aurora proposed two programs to address the fire risk posed by overhead switchgear:

1 Replace EDO fuse tubes; and

2 Replace EDO with Boric acid fuses.

In their *Aurora Revenue Review* report to the AER, the AER's consultant recommended that the funds from the first part of the program be diverted to the second part of the program, as the first part did not alleviate the entire risk.

Aurora has reviewed this proposal and considers not replacing the proposed volume of EDO fuse tubes is leaving Aurora open to uncontrollable risk which has not been addressed in the consultant's recommendation.

Aurora requests funding to allow the EDO units at all the sites identified for EDO fuse tube replacement in high and very high fire danger areas to be replaced with fire safe alternative fuses (currently Boric Acid fuses).

To make these changes to this program an additional $435,350 per year ($156,601 in very high fire danger areas and $278,749 for high fire danger areas) would be required.

2.2. Background

HV fuses are used in Aurora's distribution system to protect spur lines on feeders and pole mounted distribution transformers. The main types of HV fuses in the system are Expulsion Drop Out (EDO) fuses.

An EDO unit consists of a fibreglass fuse holder or carrier, a fuse element and a porcelain mount. The fuse holder consists of a tube, the lower casting and the tube top with a pull ring. The mount consists of an insulator, a bracket, the top and bottom terminals, bottom hinge and top contacts.

Under fault or overload conditions, the fuse element in the fuse holder will melt. This causes the fuse holder to drop down and interrupt supply, sectionalising the fault and protecting the spur or transformer. The hanging fuse holder provides a clear visual indicator that the fuse has operated.

When EDO fuses operate, there is an expulsion of hot plasma and particles from the base of the fuse tube, which has the potential to start a fire. Whilst spark catchers are available on the market, Aurora's experience is that these do little to mitigate the risk of fire starts.

As the tube of an EDO fuse weathers due to exposure to the elements the internal fibres to swell. This may cause the fusible link to stick preventing it from releasing following a downstream fault, that is the fuse switch does not drop out as designed. This results in electrical tracking inside the tube, which creates heat that in turn, results in the fuse tube catching fire, burning in half, dropping to the ground and potentially starting a fire. This is known as an EDO Hang Up.

Confidential

HV fuse related fire starts are considered a high fire risk to Aurora.

Confidential

A two-pronged approach was proposed as the most cost-effective solution to address the fire start risk posed by overhead switchgear:

1. Replace some sites with a cheaper, temporary solution (replace the EDO fuse tube); and
2. Replace some sites with a more expensive, permanent solution (replace the complete EDO unit with boric acid fuses).

The fuse tube replacement program proposed to replace fuse tubes at up to 150 sites per year in very high fire danger areas, and up to 267 sites per year in high fire danger areas. The original intention of this program was to ensure that there were no EDO fuse tubes greater than ten years old in the system by 2020 and to maintain a ten year replacement cycle.

The second component of this program is the replacement of EDOs with fire safe alternatives, such as boric acid fuses. Devices such as boric acid fuses only expel gases and not plasma and particles like EDOs, are more resilient to lightning strikes and do not "hang up" like EDOs.

This two-pronged approach was proposed as it allowed a greater number of sites to be addressed in any given year reducing the overall risk whilst progressively moving to a permanent solution.

In their *Aurora Revenue Review* report to the AER, the AER's consultant recommended that the funds from the first part of the program be diverted to the second part of the program, as the first part did not alleviate the entire risk.

The consultant did not consider the impact this would have on the overall risk profile, as this solution does not allow as many sites to be address each year.

As such Aurora is requesting that funding to this program be increased so that the same number of sites that would have been addressed by the two-pronged approach are address through a boric acid program.

2.3. Revised cost Calculation

150 sites per year in very high fire danger areas have been identified for fuse tube replacement. The difference between replacing these sites with Boric fuses rather and replacing the EDO tubes is $156,601 per year.

267 sites per year in very high fire danger areas have been identified for fuse tube replacement. The difference between replacing these sites with Boric fuses rather and replacing the EDO tubes is $278,749 per year.

2.4. Recommendation

Aurora requests funding to allow the EDO units at all the sites identified for EDO fuse tube replacement in high and very high fire danger areas to be replaced with fire safe alternative fuses (currently Boric Acid fuses).

To make these changes to this program an additional $435,350 ($156,601 per year in very high fire danger areas and $278,749 per year for high fire danger areas) would be required.

2.5. References

1 Cost calculation for alteration of SIFIF program (NW-#30241649-Edo fuse tube & boric acid workings for PD - revised)

3. Confidentiality

Aurora considers the follow section of this document to be confidential:

- Section 2.2

3.1. Claim for Confidentiality

3.1.1. Claims

Aurora claims confidentiality over certain sections of this document and reference documents identified in the table of to this *Document* on the grounds that such attachments:

(1) contain information that is not common knowledge or publicly available;

(2) contain information of a commercial value that would be reduced or destroyed by any disclosure;

(3) concerns the lawful commercial financial affairs of Aurora, and if disclosed, that information could unreasonably affect Aurora;

(4) contain information about a third party, which Aurora is not authorised to disclose;

(5) contain trade secrets;

(6) contain information that is the intellectual property of Aurora; and

(7) contain information which may injure the public interest if disclosed;

3.1.2. Reasons

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