Revised Regulatory Proposal

Supporting Information: LV Underground Cables (REULC)

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. LV Underground Cable Replacement (REULC)

2.1. Summary

In Aurora's *Regulatory Proposal*, Aurora proposed replacement of 0.6 km of low voltage cable (excluding CONSAC cable) per annum throughout its network. The aim of the programme was to manage the risk of in-service failures associated with these assets, ensuring the safety risk is appropriately managed, and both network security and reliability of supply do not deteriorate below their current level.

The programme would allow for proactive replacement of low voltage LV cables[1] when they are deemed to be at their end of life. Preventative asset replacement is seen as the most appropriate and cost effective approach to managing these assets. Reactive asset replacement under fault would not be a cost effective solution as it would increase expenditure in this area, and also result in greater impact to customer supply.

Although the AER's benchmark model predicts capital expenditure should be in excess of Aurora's forecast, and that Aurora may be under investing in cables[2], it has not supported this replacement programme.

With Aurora's aging and deteriorating asset base, Aurora believes no capital expenditure in this area would result in an outcome that would be detrimental to Aurora's business and its ability to adequately supply its customers. This would result in an unnecessary imposition on the business with it being unable to proactively manage these assets.

This documentation provides additional information and further justification to support Aurora's prior submission for this programme.

Aurora contends that the AER had made an error in its decision. This programme and expenditure forecasts to the value of $700k is an appropriate level for LV cable replacement over the forthcoming *Regulatory Control Period*.

2.2. Background

In Aurora's *Regulatory Proposal*, Aurora proposed replacement of 0.6 km of LV cable, with a forecast of $700k over the *Regulatory Control Period*.

Although the AER's benchmark model predicts capital expenditure should be in excess of Aurora's forecast, and that Aurora may be under investing in cables, it did not support the replacement programme as the justification for the programme was not adequately addressed.

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[1] This programme excludes CONSAC cable replacement, which will be undertaken under a separate programme of work.

[2] Report – Principle Technical Advisor, Aurora Electricity Distribution revenue Review, Nuttall Consulting , 11 November 2011

Aurora currently has a replacement programme in place to replace CONSAC cable, with replacement focused on areas of high risk. This programme has been fully supported by the AER.

Aurora currently has 1,098 kilometres of LV cable installed; of which 222 kilometres is paper insulated cable, with an age ranging from 30 to 50+ years. A summary of the LV cable types, age profiles and in service lengths is provided in Table 1.

Description	Voltage	Installation period	Installed length (km)
Paper insulated, oil draining	LV	Pre - 1960	15
Paper insulated, mass impregnated non-draining (MIND)	LV	1960 - 1978	207
CONSAC	LV	1971 - 1980	189
XLPE insulated, PVC sheathed (single to four core)	LV	1978 - current	687

Table 1: Low voltage cables lengths by type in Aurora's distribution system

2.3. Justification

The aim of this programme is to proactively replace assets that are deemed to be at their end of life, ensuring the safety risk is appropriately managed, and both network security, and reliability of supply are maintained at their current level.

In addition to CONSAC cable replacement, due to the deteriorating condition of these assets Aurora believes replacement of other cable types will also be necessary in the forthcoming regulatory period. This is supported by an increase in failure rates, a consequence of the increasing age profile of the assets (see Table 3).

Over the preceding 10 years failure rates of LV cables (non CONSAC) have increased by approximately 17 per cent, with an average of 17 asset failures per year for the past two years. There have also been several instances of multiple failures on these assets, with a deteriorating condition of the cable seen as the root cause. The instances of cables with multiple faults is summarised in Table 2.

Table 2. Instances of cables with multiple faults

No. of faults on cable	No. of cables
2	13
3	3
4	2

The accepted asset life for paper insulated cables is 50-60 years, but dependant on both operational and environmental conditions it may be notably less. Aurora installed a considerable length of underground cable through the 1960's, and with approximately 200km of cable now in the 40-60 years age bracket, Aurora believes the increase in failure rates are indicative of the deteriorating condition of the assets, with some nearing, or at their effective end of life.

To address this increasing trend Aurora has seen it as an appropriate management strategy to consider replacement of cables (or part thereof) where there are repeated occurrences of faults.

Several of Aurora's cables fall into this category, with cable replacement proposed in its 2012/13 programme of work. This work consists of replacing the problematic sections of cable, with an estimated cost of $268k.

The funding proposed for this programme is an absolute minimum for managing these assets, with it only allowing for very limited replacement in exceptional circumstances where no other alternatives exist.

As this is a new capital programme historical records for expenditure in this area do not exist, although replacement of defective LV cable has occurred in previous years, and with the increasing trend of cable faults sound justification exists for the introduction of this programme.

The analysis undertaken by Aurora has concluded that if no provision is made by the AER for expenditure in this area then Aurora would not be able to adequately maintain these assets. The alternative would be the continuation of repair under fault, with an expected rise in the frequency of faults at time progresses, and an ever reducing level of customer service. This alternative approach of encompassing reactive rather than proactive management would not provide an acceptable outcome for Aurora or its customers.

To address this situation for the forthcoming regulatory period this programme has been identified as the most appropriate and cost effective solution.

2.4. Recommendation

Aurora contends that the AER had made an error in its decision. This programme and expenditure forecasts to the value of $700k is an appropriate level for LV cable replacement over the forthcoming *Regulatory Control Period*.

2.5. References

1 NW-#30201118-Justification: REULC - Replace LV UG Cables

3. Asset Base

The cables installed in Aurora's distribution system are detailed in Table 3.

Table 3. Cables installed in Aurora's distribution system by type

Description	Voltage	Installation period	Installed length (km)
Paper insulated, oil draining	HV	1920-1960	30
	LV	Pre-1960	15
Paper insulated, mass impregnated non-draining (MIND)	HV	1960-1992	505
	LV	1960-1978	207
Paper insulated, oil-filled	HV	1964-1971	16
XLPE insulated, PVC/HDPE sheathed	HV	1992- 2010	447
XLPE-TR insulated, PVC/HPDE sheathed	HV	2007 - Current	100
CONSAC	LV	1971-1980	189
XLPE insulated, PVC sheathed (single to four core)	LV	1978- current	687
Submarine cable – Draining type	HV	1914-1960	6
Submarine cable – MIND	HV	1960-1992	15
Submarine cable – XLPE insulated, PVC/HDPE sheathed with overall metallic sheath and steel wire armouring	HV	1992-2008	9

4. Confidentiality

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