Revised Regulatory Proposal

Supporting Information: Pole Replacements

Aurora response to the AER's Draft Distribution Determination

January 2012
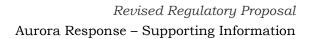
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1.   Introduction

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.   Pole Replacements

2.1.   Summary

In its *Draft Distribution Determina*tion on Aurora Energy's proposed Pole Replacement expenditure, the AER considers that Aurora's asset management practices are resulting in volume forecasts that are inefficient. As a result the AER has proposed a $14.7m reduction for these programs over the forthcoming *Regulatory Control Period*.

The AER's conclusion that these programs are inefficient is based on the *Aurora Electricity Distribution Revenue Review* by Nuttall Consulting (The Report) (reference 1).

In reviewing the Report, Aurora believes there are significant incorrect assumptions contained within this report. These include:

- Adopting an incorrect asset life;
- Using a model that has not been validated;
- Using a model based on a number of incorrect assumptions;
- Ignoring the lower class of timber used in Tasmania for poles and misunderstanding the treatment process, and
- Ignoring expenditure from 2009/2010.

Additionally, the Draft Distribution Determination did not consider the impacts on risk to public safety of reducing pole expenditure.

Due to the number of errors and inconsistencies in the methodology used to dismiss Aurora's proposed expenditure, Aurora contends that the AER should adopt Aurora's original estimate for pole expenditure.

2.2.   Introduction

In its *Draft Distribution Determination* on Aurora Energy's proposed Pole Replacement expenditure, the AER considered that Aurora's asset management practices are resulting in volume forecasts that are inefficient. As a result the AER has proposed a $14.7m reduction for these programs over the forthcoming *Regulatory Control Period*.

The AER's conclusion that these programs are inefficient is based on the *Aurora Electricity Distribution Revenue Review* by Nuttall Consulting (The Report) (reference 1).

In reviewing the report, Aurora believes there are significant incorrect assumptions contained within this report.

The reasons given in the Report for this reduction were:

1 The assertion that Aurora's estimated volume forecasts are wrong, because the condemnation rates and asset lives Nuttall Consulting implied from these volumes are not acceptable; REPEX modelling resulted in lower volumes than those proposed by Aurora Energy; and

2 Rejection of pole life proposed by Aurora Energy.

The report proposed that funding for poles should be based on historical values but only after removing expenditure in 2009/2010.

Accepting the AER's decision in this matter would result in insufficient funding to prudently manage pole failures and increase the public safety risk associated with such failures to unacceptable levels.

The remainder of this report considers each of these reasons for reducing pole expenditure and discusses why they are flawed.

2.3. Condemnation Rates and Standard Lives

Nuttall Consulting used Aurora's volume forecasts for pole replacement and staking to calculate condemnation rates and from these condemnation rates estimated the average asset life. The average asset life was estimated in the order of 19 to 25 years and used to dismiss Aurora's forecast volumes.

This methodology ignores the fact that as wooden poles age their failure rate increases.

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Thus, Aurora believes that the methodology used to imply service lives is flawed and should not be used to dismiss Aurora's volume forecasts.

2.4. REPEX Model

Aurora's forecasts of pole expenditure are compared to an age based replacement model (REPEX) produced by Nuttall Consulting.

There are a number of issues relating to this model:

1 Validation of the REPEX model; and

2 Assumptions used in the REPEX model.

These issues are discussed below.

2.4.1. REPEX Model Validation

The AER provided information in an email (reference 2) to explain the validity of using the REPEX model. The main justification for using the model is that it is the same one used to assess Victorian DNSPs.

This statement suggests that the Victorian DNSPs supported the model, which is incorrect. These DNSPs raised a number of objections, which do not appear to have been addressed.

In replying to objections raised by Victorian DNSP's (reference 3) Nuttall Consulting placed significant weight on the model being similar to others and based on sound application of probability. However, this does not address the validity of the model. For the model to be valid it must replicate the behaviour of assets being modelled. There is no evidence that the model replicates asset behaviour, so it cannot be considered valid.

In applying the REPEX model NC used 'scaling factors' and/or other adjustments to the model so that it replicated some (but not all) aspects of historical asset behaviour. If the model output does not match historical date without manipulation then there can be little confidence that it would match future asset behaviour.

As the REPEX model has not been validated against the performance of real assets and has to be manipulated to fit historical data then it cannot be seen as a reliable estimator of future asset behaviour.

Thus, as the model has not been validated, Aurora believes it should not be used to dismiss Aurora's forecast expenditure.

2.4.2.   REPEX Model Assumptions

The REPEX model, as with any model, is relies on a number of assumptions to model an outcome. If any of the assumptions used in the model are incorrect then the model output is incorrect.

Aurora believes there are a number of incorrect assumptions within the REPEX model:

1   Dismissal of Aurora's pole age profile;

2   The assumption that pole characteristics do not differ across DNSPs;

3   The use of non-CPI indexed costs in the model;

4   The use of a normal distribution; and

5   Sensitivity of the model to pole age.

Each of these points are discussed below.

Nuttall Consulting did not use the pole age profile provided by Aurora because they believed the data was suspect because there was a steep rise in the age profile of assets around 1960. As it has been standard practice since the beginning of the 1960s to include a pole identification disc with a date on purchased poles and this date was used to 'date' assets Aurora has a high degree of confidence in the pole age in its asset database is correct..

The AER was asked how the REPEX model allows for the differing operating contexts of DNSPs. From the response (reference 2) it is clear that the model assumes that the operating context of assets is the same across all DNSPs.

As, for example, the rotting of poles is dependent upon availability of moisture and much of Tasmania is 'wetter' than say central Victoria, this assumption is incorrect.

The AER confirmed (reference 2) that part of the REPEX model utilised historical costing but the figures weren't adjusted for CPI. This distorts the model outcomes as historical costs clearly do not relate directly to present day costs.

The REPEX model assumes that assets fail in accordance with a normal distribution with a standard deviation equal to the square root of the mean.

In a response provided by the AER the reasoning for this was:

1 Aurora did not provide an alternative distribution;

2 The normal distribution is a reasonable approximation to asset reliability; and

3 A normal distribution is used by others.

A normal distribution is not normally used to model failure data as it has very limited application and as acknowledged by Nuttall Consulting (reference 3), a Weibull distribution is often used for replacement modelling. As mentioned earlier Aurora is developing a pole model that uses the Weibull distribution. Contrary to comments from Nuttall Consulting, the distribution parameters were easily developed and the resulting distribution bears no relationship to a normal distribution. Importantly, the failure rate of assets increases dramatically as the assets age. Using a normal distribution to model Aurora's poles would be extremely conservative and underestimate the number of failures.

Nuttall Consulting produced a 'calibrated' REPEX model and a 'benchmark' REPEX model. The difference between the models is that one assumed the asset life of poles is 56 years and the other 59.9 years.

Although the difference was only 3.9 years the difference in projected expenditure varied by around $3m to $4m per year. The model is very sensitive to changes in asset life. Aurora's forecast of expenditure generally lies between the calibrated and benchmark model.

The Weibull analysis undertaken by Aurora showed that the average asset life of Aurora poles is 55 years, which is less than the values used by Nuttall Consulting. The Weibull analysis is based on not only on actual records of asset failures but also suspensions (asset data for assets that haven't failed).

Given the sensitivity of the REPEX model to asset life using the actual life of 55 years in the model would show that Aurora's expenditure forecasts are well below those predicted by the REPEX model.

2.5.   Pole life

Aurora uses Durability Classes 3 and 4 timber, as per AS5604-2005 (which have an average asset life of 0-15 years when untreated) for poles whereas mainlands DNSPs usually use Classes 1 and 2 timber (which have an average asset life of 15->25 years when untreated). This makes a significant difference to the life of poles and explains why the life of Aurora's poles should be less than other DNSPs.

Nuttall Consulting dismissed this argument as poles are treated.

Timber poles are treated with CCA to extend their life, but it is incorrect to assume that all the timber within a pole is treated. The treatment process only impregnates the sapwood (around 25 mm) whilst the remaining wood (heartwood) is untreated. Timber can rot either externally or internally and whilst the treatment process can reduce the effect of external rot it does not impact on internal rot.

The heartwood is natural and this is where the durability classification becomes important in asset life.

Although the CCA treatment extends the life of the pole there is no engineering reason to expect that it would result in a pole with the same life as the poles used on the mainland which are also treated.

Thus, Aurora believes that Nuttall Consulting has incorrectly dismissed the lower class of timber used for Aurora poles as a reason for why pole lives are less than those in other DNSPs.

2.6. Ignoring 2009/2010 Expenditure

In preparing an estimate of future expenditure Nuttall Consulting chose to ignore expenditure in 2009/2010 as there were more storms that year than other years. This reasoning does not have any engineering basis.

Whilst there may have been more storms that year compared to others it is quite realistic to expect that type of event to occur repeatedly in the future.

Though storm damage may have been higher than other years there was an increase in the number of poles that were replaced due to deteriorating condition. The deteriorating condition is not affected by the presence of storms. Aurora's estimates allowed for reduced expense due to storms but also took into account the increasing failure rate of poles.

A matter not considered by the consultant is that any poles which fail during a storm are, most likely, already in a weakened state and the effect of the storm is to bring the failure forward.

During 2008/2009 Aurora purchased 4074 timber poles and during 2009/2010 4167 poles were purchased. The difference between the two years of around 2% is not suggestive of a significantly higher failure rate due to storms.

The increase in 2009/2010 is not inconsistent with an ageing asset base that has an increasing risk of failure as the assets age which was discussed earlier in this report.

2.7. Pole Risk factors

A pole failure occurs when a pole can no longer support the load and falls to the ground. The falling pole may hit a member of the community and could pull down live wires, which not only present a risk to people in the immediate vicinity but could start a bushfire.

Should the AER resolve to reduce expenditure on poles then this can be accommodated by reducing the trigger points that are used to determine when a pole is replaced (i.e. allow greater amounts of deterioration). This would increase the number of pole failures and this wasn't a matter addressed by NC.

2.8.   Data Inconsistencies

The Report mentioned there were inconsistencies in the data presented to the consultant. This may be true but the data is from the same source and any difference relates to when the data was extracted from the database and the purpose for which it was used.

2.9.   Recommendation

The Report by Nuttall Consulting made a number of errors and incorrect assumptions, including:

- Adopting an incorrect asset life;
- Using a model that has not been validated;
- Using a model based on a number of incorrect assumptions;
- Ignoring the lower class of timber used in Tasmania for poles and misunderstanding the treatment process, and
- Ignoring expenditure from 2009/2010.

Additionally, the *Draft Distribution Determination* did not consider the impacts on risk to public safety of reducing pole expenditure.

 Due to the number of errors and inconsistencies in the methodology used to dismiss Aurora's proposed expenditure, Aurora contends that the AER adopt Aurora's original estimate for pole expenditure and this has been re-forecast in Aurora's *Revised Regulatory Proposal*.

2.10.   References

1   Aurora Electricity Distribution Revenue Review, Nuttall Consulting, November 2011

2   Information Request-AUR/004 AER response December 2011

3   Nuttall Consulting, Victorian Electricity Distribution Revenue Review Revised Proposals, October 2010

4   N Hastings, Albany Interactive Pty Ltd, Aurora Power Poles Weibull Analysis, October 2011

3. Confidentiality

3.1. Confidential Sections

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

- Section 2.3.

In addition, Aurora considers sections of the following document provided as an attachment to its *Revised Regulatory Proposal* to be confidential:

- Aurora Power Poles Weibull Analysis

3.2. Claim for Confidentiality

3.2.1. 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;

3.2.2. Reasons

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