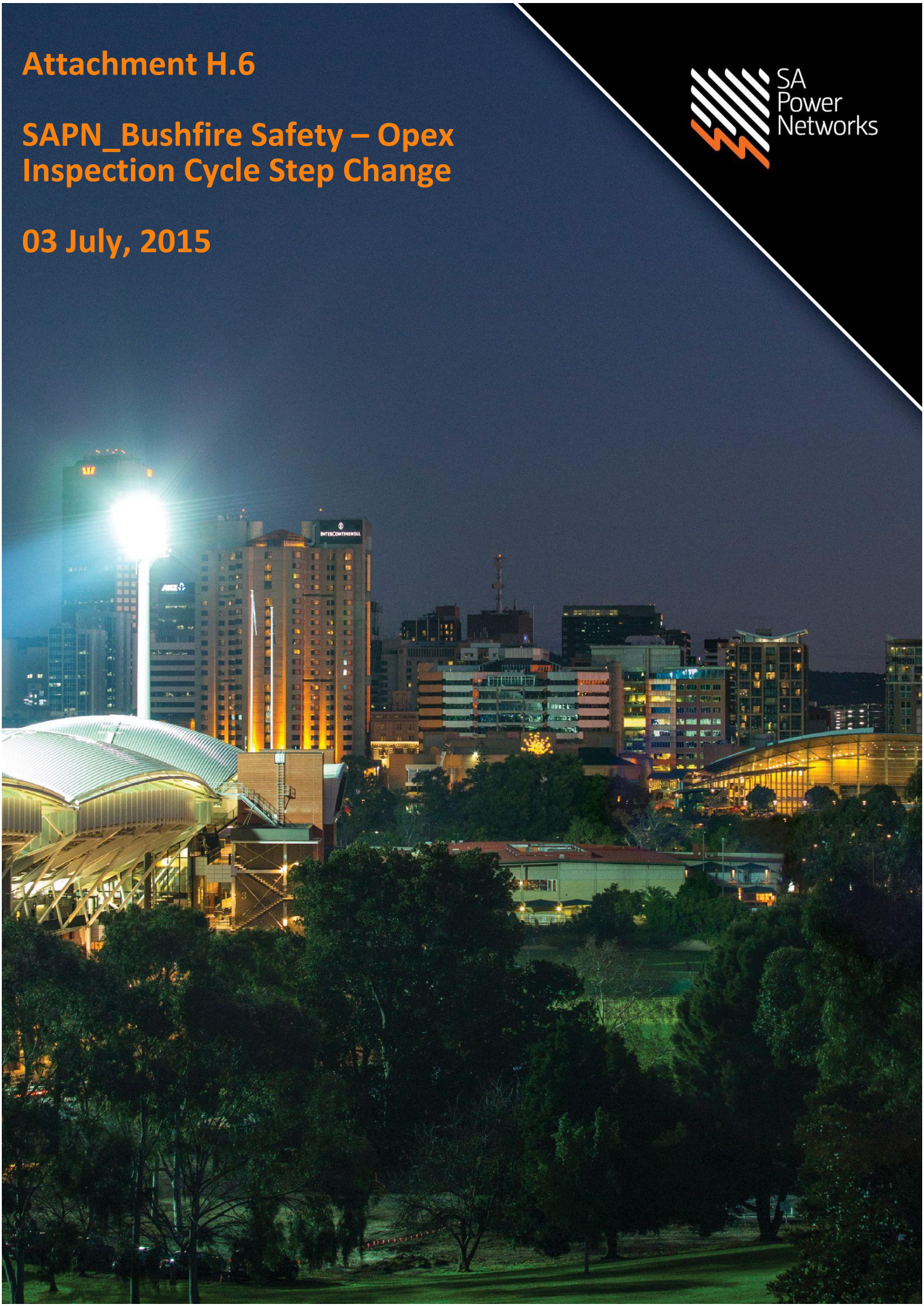
Attachment H.6

SAPN_Bushfire Safety – Opex Inspection Cycle Step Change

03 July, 2015



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1 Additional information in support of the increased BFRA asset inspection program

SA Power Networks provided a significant amount of evidence in support of our proposed step change for more frequent asset inspections in Bushfire Risk Areas (**BFRAs**) in our Original Proposal for the 2015-20 regulatory control period (**RCP**). This included section 1.1.3 of Attachment 21.13 'Operating Expenditure SCS Step Changes' and Supporting Documents 20.13 'Asset Inspection Strategy Business Case' and 21.40 'Multi-variable Inspection Forecasting model.'

This document contains additional evidence to that presented in the Original Proposal and the Revised Proposal (section 8.13 of the Revised Proposal in particular), specifically in respect to the asset inspection model.

2 Executive summary

In its Preliminary Determination, the Australian Energy Regulator (**AER**) rejected our proposed step change in operating expenditure for more frequent asset inspections in BFRAs. In making this decision, the AER accepted that we need to change our inspection cycle in BFRAs, but considered that including an allowance in our operating expenditure forecast was not necessary.

We have provided additional evidence in this document to address the AER's concerns and demonstrate why an allowance in our operating expenditure forecast is necessary in order for SA Power Networks to be provided with a reasonable opportunity to recover at least the efficient costs of complying with our safety related regulatory obligations.

In particular, we note that the AER had concerns with our inspection forecasting model, specifically relating to the clarity of the model and our use of 2013/14 inspection data as the base.

We have provided more information in relation to this model in this document to explain how the model was used to prepare our forecast and set out why this model and its application is appropriate for preparing the operating expenditure forecast in these circumstances.

The key methodological matters discussed are:

- historical inspection costs (compared to 2013/14) are an input to derive a linear model that reflects the inspection cost per unit length of line inspected for various feeder parameter sets (e.g. the voltage of feeder, the regions of the feeder, etc); and

- individual feeder parameters and inspection cycle data are an input to forecast the inspection costs for each feeder, based upon this linear model.

The step change forecast in our Original Proposal (and now our Revised Proposal) is the difference between two forecasts prepared by this model:

- a forecast assuming no change in inspection practices; and

- a forecast assuming the more frequent inspection cycle in BFRAs.

With regard to our use of historical data for 2013/14 to develop the inspection unit costs rates (per length of line inspected), we consider that this is appropriate because:

- there have been changes in our inspection practices in the preceding years that mean the inspection cost per unit length of line inspected have changed over the same period; and

- if an alternative year or an aggregate across years was used then the step change forecast would be inconsistent with the base year. In effect the step change would be allowing for the costs of inspection practices that we no longer apply.

Based upon the above, our operating expenditure forecast must allow for a step change to implement our proposed more frequent asset inspections in BFRAs.

3 Need for an operating expenditure step change

Although the AER, in its Preliminary Determination, accepted that we need to increase the frequency of our inspection cycle in BFRAs to bring it in line with good electricity industry practice, it stated that it was "not persuaded" that SA Power Networks "requires additional funding to implement these practices."[1]

Unfortunately, the AER's preliminary decision did not provide specific reasons as to why they were of the view that we did not need additional funding for this program. It did however provide some general discussion on this matter, stating:

> *'[the AER's] task is to determine the total amount of funding SA Power Networks needs to carry out its regulatory obligations. While it may be prudent for SA Power Networks to change one particular business practice, this is not sufficient evidence that it needs additional funding. The cost of individual programs and projects often change over time, but these changes can be accommodated without increasing total spending. SA Power Networks has not persuaded us that this change cannot be accommodated without a step change.'*[2]

We understand that this means that the AER considers the increased costs associated with implementing the reduction in the inspection cycle will be balanced by changes elsewhere – although whether these other changes are related to or unrelated to the change in the inspection cycle is unclear.

SA Power Networks' general concerns over the AER's approach to the substitute forecast of operating expenditures made in its preliminary decision are discussed in section 8.4 of the Revised Proposal. Simply put, SA Power Networks cannot meet materially growing costs simply by improving efficiency elsewhere in its business.

[1] AER, *Preliminary Decision: SA Power Networks determination 2015-16 to 2019-20*, April 2015, p 7-80.
[2] AER, *Preliminary Decision: SA Power Networks determination 2015-16 to 2019-20*, April 2015, p 7-80.

4 Inspection forecasting model

The AER, in its Preliminary Determination, noted that any step change should relate to the estimated incremental cost of total operating expenditure that would not have otherwise occurred without the change in practice. The AER also stated that it had the following concerns with our approach to estimating the cost of the proposed step change[3]:

1. **Insufficient clarity about the Multi Variable Inspection (MVI) forecasting model**

   The AER noted that we had used what it considered to be *'a complex forecasting model which contains line-by-line estimates of every pole inspection SA Power Networks plans to undertake over the 2015–20 regulatory control period.*' It was of the view that we did not provide sufficient clarity about the underlying assumptions supporting the forecast, stating that, '*[i]n all forecasts we expect service providers to clearly outline all the main assumptions and inputs used and demonstrate how these affect the relevant forecast.*'

2. **The use of 2013/14 inspection data as the base**

   The AER considered it was not clear why pole asset inspection expenditure in 2013/14 should be used as the baseline for preparing the forecast. In support of this view it noted that our forecasting model showed that our annual pole inspection expenditure was not consistent during the 2010–15 RCP.

We discuss these two concerns in turn below.

4.1.1 Our inspection forecasting methodology

We understand that the AER's concerns mainly related to our MVI model. We did not provide significant documentation on this model with our Original Proposal because we believed that AER would request a demonstration from us if it was unsure how it functioned.

To assist the AER's understanding of the model, we summarise the key methodological underpinnings of this model below.

The MVI model needs to be viewed as two elements, which are contained in the single excel workbook:

- the **inspection unit cost model**, which is "calibrated" to reflect actual inspection costs; and
- the **feeder inspection forecasting model**, which produces an annual inspection forecast for each feeder.

The inspection unit cost model is a type of linear parametric model that calculates the inspection costs per length (km) of line inspected, based upon various feeder parameters. We have selected these parameters based upon our knowledge of the drivers of inspection costs, supported by sensitivity analysis performed within the MVI model.

The parameters in this inspection unit cost model include:

- feeder voltage;

[3] AER, *Preliminary Decision: SA Power Networks determination 2015-16 to 2019-20*, April 2015, p 7-80

- the region of the feeder; and
- contractor group.

The coefficient for each parameter of this model has been derived from a set of inspection work orders from 2013/14. These work orders are extracted from our financial database and form the input to this element of the MVI model i.e. each work order represents a row in the model.

Each work order relates to asset inspections performed on a section of feeder, and includes fields that capture the inspection costs, the length of line inspected, and measures of the various parameters noted above.

We then use analysis to determine the linear coefficient for the inspection parametric model from the set of work order inputs.

Obviously, the key assumption here is that the inspection costs per unit length of line can be represented by such a linear model. We believe this is appropriate for these circumstances given the sensitivity analysis we have conducted and the method we have used to develop the coefficients of the model.

The feeder inspection forecasting model uses the inspection unit cost model (as derived above) on data for each feeder to forecast its future inspection costs. That is:

> *'given it was last inspected in year x and its inspection cycle is y, the inspection unit cost model forecasts the inspection cost will be z in year x + y, based upon the length of feeder and its various parameters.'*

Each individual feeder forecast is then aggregated to produce the total inspection forecast.

The main inputs to this part of the model are data on the set of feeders i.e. each row in the model reflects a feeder where columns reflect the various feeder parameters (plus others used for other purposes not relevant to our discussion here).

The incremental cost of the inspection cycle changes is calculated as the difference between two forecast scenarios:

1. the base line scenario reflecting no change to inspection cycles; and
2. the step change scenario reflecting the changes to the inspection cycles for the feeders in the BFRAs.

For the step change scenario, we do have to manually update the next inspection date in the BFRAs. This is necessary because we cannot assume all lines will immediately fall within the new inspection cycle. This would result in a large step increase in opex in the first year of the forecast to address all feeders that are beyond the new five year cycle. To achieve this, we have assumed:

- all feeders will be 'In Cycle' according to their original parameter by the end of 2018;
- the resourcing needed to bring the out of cycle feeders in cycle will be held as flat as possible;

- there can be no large step change in 2015 due to the need to allow for training of resources; and

- feeders with a new cycle step will be aligned to their new cycle by the end of 2020.

4.1.2 Our use of 2013/14 as the baseline

Given the forecast uses an inspection rate model that defines the inspection cost per unit length of line inspected, 2013/14 has been used to set the parameters of this model because:

- there have been changes in our inspection practices in the preceding years that means the inspection cost per unit length of line inspected have changed over the same period; and

- if an alternative year or an aggregate across years was used then the step change forecast would be inconsistent with the base year. In effect the step change would be allowing for the costs of inspection practices that we no longer apply.

We have made a number of changes to our inspection practices over the last five year period. These changes have largely increased the scope of the inspection activities performed when each asset is inspected.

As a result, the cost per unit of line length inspected will have increased over this period. Therefore, 2013/14 inspection costs are used to define the base line to ensure the projection forward of our ongoing costs appropriately reflects current practices.

In appreciating this reasoning it is important to note that the year-to-year variations in the total inspection costs (that the AER may be alluding to in the preliminary decision) are more heavily influenced by the volume of lines inspected from year-to-year. This volume is a function of our various inspection cycles, and so it changes year by year in a cyclical fashion. We cannot maintain a uniform volume of inspections in each year and comply with our inspection cycles.

These aggregate year-to-year differences do not affect our forecasting approach as this is based upon deriving a per unit inspection cost. Setting aside the issues of the inspection volumes changing from year to year, as discussed above, this method of producing a forecast should be less sensitive to aggregate changes due to the volume of lines inspected in any year because this should not change the inspection cost per unit of line length inspected.