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Review of the F-Factor Draft Determination by the Australian Energy Regulator as applied to United Energy

1. Executive Summary

The draft determination by the Australian Energy Regulator (AER) resulted in a reduction in the target number of fire starts from 133.4 claimed by United Energy to 124.2 for the first year of the f-factor scheme.

A review of the AER draft determination report and related documentation provided by United Energy[1] has cast doubt over the reasoning and methods applied by the AER in making the determination. These relate to:

- Assumptions by the AER and its consultants Sinclair Knight Merz (SKM) as to the robustness and accuracy of the fire start data available from the existing data capture systems whose prime focus is recording of reliability data rather than fire start data;
- Unsubstantiated statistics (10% of all fire starts typically equates to unreported fire starts) applied by the AER[2.] as validation of the results obtained from the application of the United Energy data to the model proposed by Jemena for the assessment of unreported fire starts;
- Failure by the AER to apply the same unsubstantiated statistics as a cross check to the results previously obtained (by the Jemena method) for Jemena (a cross check performed as part of this report showed major disagreement between the numbers obtained);

[1] See submission by United Energy, Further information pertaining to United Energy's response to the F-factor Regulatory Information Notice (RIN): The determination of uplift coefficients, 20th September 2011.

[2] Energy Transfer Solutions acknowledges that the statistics utilised by UE were not substantiated by analysis. However, the numbers were, at least, chosen by persons with extensive experience of the distribution network and have been subject to validation by sensitivity analysis. In contrast, the AER did not attempt any form of sensitivity analysis.

- Unclear reasoning by the AER as to the basis for rejecting the method proposed by United Energy for the assessment of unreported fires (number of potential fires should not exceed reported fires);

  The unsubstantiated basis used by the AER in their rejection of the findings by SKM that the method proposed for determination of unreported fire starts by United Energy and the results obtained were reasonable;

In light of these points it is considered that the process applied to the assessment of unreported fire starts for United Energy and hence the f-factor target number by the AER was flawed.

Notwithstanding the uncertainties inherent in the records of fire starts, a sensitivity analysis of the uplift factors applied by United Energy to each of the potential fire start categories showed that even with the application of a negative variation of up to 2%, the resultant range of numbers of annual potential fire starts was greater than the number allocated by the AER in its draft determination, and suggests that the allocation may be low.

Under the f-factor scheme, the collection of fire start data will be mandated. Energy Transfer Solutions anticipates that there will be enhanced reporting of fire starts, and a consequent reduction in the uncertainty and subjectivity associated with the existing recording system.

2. Introduction

This report covers an independent review of the Draft determination by the AER with regard to the "f-factor" submission by United Energy (UE)[3]. The f-factor scheme establishes a framework whereby financial incentives are applied to the Electricity Distribution Network Service Providers (DNSPs) to reduce the number of fire starts in their respective distribution networks. The system is premised upon the establishment of agreed "target" numbers of fire starts for each DNSP.

3. Background

In its development of the draft determination for "target numbers" of fire starts, the AER considered historical data regarding fire starts as submitted by UE and the other DNSPs. In recognition of the different fire reporting requirements over the years and differences in the standards of fire reporting it also considered an "allowance" for fires which may have not been previously reported[4].

To that end, in addition to the actual fire start report data, DNSPs were invited to propose means for the assessment of those fire starts which had not been previously reported. Based on its considerations, UE submitted that an allowance (in the first year of the scheme) be included for an additional 20.2 fires per year which would result in an increase in its target number of fire starts to 133.4. This allowance was based upon a listing developed by UE of faults over the previous 5 years which had the potential to cause fire starts along with an estimate of an adjustment factor to represent the percentage of fires under each fault category which may not have been reported.

The AER engaged the services of Sinclair Knight Merz (SKM) to assist with its assessment of the submissions from the DNSPs. The UE submission received favourable review from SKM, which considered that it was reasonable and suggested a slightly reduced target number of 132 fire starts[5]. The AER on the other hand took a more critical view, in particular noting the lack of statistical data to support the claimed adjustment factor increase in the number of fire starts by UE. This criticism was further compounded by the very high number of "potential" fire starts

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[3] AER, *Draft determinations and Explanatory statement for the draft determinations, F-factor scheme determinations 2012-15 for Victorian electricity distribution network service providers*, Australian Energy Regulator, 5th October 2011.

[4] Ibid. page 16. The AER did not use the term "allowance" explicitly, however, it accepted, in the context of the Jemena Electricity Network, that "only 80 per cent of non-pole fires had been recorded in the past".

[5] SKM, *F-factor Incentive Scheme, Review of Submissions from Distribution Network Service Providers - Addendum*, Sinclair Knight Merz, 22nd September 2011; page 4. The reduction was simply a result of revisions to the historical data put forward by UE, and was not a consequence of any changes to the methods employed.

which had been cited by UE, the result of which would see even a small change in the percentage adjustment factor translate into a large increase in the number of fires.

The AER applied an alternate method as proposed by Jemena (and agreed by the AER) to the recorded fire start data from UE to arrive at a significantly lower target number of 124.2.

4. Analysis of AER Considerations

4.1 Quality of Data

The considerations and ultimately the conclusions drawn by the AER are premised on the comments from SKM regarding the quality of the data submitted by the DNSPs. The AER drew upon the report by SKM and noted that[6]:

- All Victorian DNSPs appear to have robust systems to capture reliability data.
- The fire start data is sourced from DNSPs' core business systems.
- The DNSPs' data is a balanced and robust view on the number of fire starts associated with each DNSP's network.

What appears not to be appreciated by either SKM or the AER is that because the DNSPs data collection systems are focussed primarily on network reliability parameters their ability to accurately record fire starts is compromised. This is evidenced by the fact that fire start information is captured as a comment in a text field rather than as a specific reporting code. In addition, the absence of a requirement to report fire data resulted in a reporting process that was spasmodic and lacking in rigour in the field. The collection of fire evidence was not systematic.

Thus fire start information retrieved from the data systems is far from conclusive and is obtained via word searches. The specific records that are extracted are also amenable to differing interpretations. The problem is further compounded by the lack of specific "standard" words or terms being used when the data is originally reported.

On this basis it is considered that the heavy reliance of the AER on the fire start data as being largely definitive is flawed and a greater proportion of fire starts have gone unreported than previously claimed.

4.2 The Jemena Formula

The AER considered favourably the method proposed by Jemena for the assessment of previously unreported fire starts which, simplistically, concluded that 80% of non-pole fire related fires had been correctly reported, and hence the uplift that was needed was obtained by

[6] AER, *Draft determinations and Explanatory statement for the draft determinations, F-factor scheme determinations 2012-15 for Victorian electricity distribution network service providers,* Australian Energy Regulator, 5th October 2011; section 3.4, pages 14 and 15.

grossing up the reported value by a factor of 1.25 (equal to the reciprocal of 0.8). The scaling up adjustment gave 2.1 fires per annum[7].

The AER chose to reject the approach taken by UE to assess previously unreported fire starts and instead applied the Jemena method to the fire start data submitted by UE. This resulted in an uplift allowance being allocated to UE of 12.2 fires per year rather than the 20.2 as claimed by UE.

The AER validated its approach by a subsequent "sanity check" in which it compared the number of unreported fires determined by this method (the Jemena method) to the total number of reported fire starts by UE. The comparison resulted in a figure of 10.8% of total fire starts being previously unreported. The AER then concluded that "..... an assumption that 10 per cent of fire starts were not recorded, possibly arising from different historical reporting requirements, would be reasonable to account for previously unrecorded fire starts for United Energy"[8].

The AER has provided no basis at all for its conclusion that 10% of all fire starts is reasonable for UE other than its application of the Jemena formula to the UE data. Additionally, if it chose to allocate its "estimated" 10% of all fire starts being unreported to the Jemena data then it would result in a significant increase in the uplift provision allowed for Jemena from 2.1 fires per year to 5.5 fires per year[9].

It is considered that this discredits the previous validation by the AER of its allocation of a 10.8% factor to the unreported fire starts in UE.

At the very least it is considered that this invalidates any basis for the AER to reject the assessment by SKM, which was that the UE claim was reasonable. SKM suggested a similar uplift to that claimed by UE[10].

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[7] The total number of fires reported by Jemena, excluding pole fires, was 8.4 fires per annum (= ((276-234)/5)). When grossed up, this value becomes 10.5 fires per annum, and so the increase is 2.1 fires per year.

[8] AER, *Draft determinations and Explanatory statement for the draft determinations, F-factor scheme determinations 2012-15 for Victorian electricity distribution network service providers*, Australian Energy Regulator, 5th October 2011; section 3.1.5.2, page 18.

[9] Jemena reported 276 fires over 5 years. From this value, 10% = 27.6 over 5 years, or 5.5 fires per year as compared to 2.1 assessed by the 80% method proposed by Jemena and as agreed by the AER.

[10] SKM, *F-factor Incentive Scheme, Review of Submissions from Distribution Network Service Providers - Addendum*, Sinclair Knight Merz, 22nd September 2011; page 4.

4.3 UE Method

The AER was critical of the method proposed by UE to account for previously unreported fires which involved the allocation of a percentage uplift factor to identified likely causes of fire starts[11]. The criticism was based upon the fact that UE had provided no statistical basis to support the percentages allocated.

This is considered extraordinary and somewhat contradictory in light of its acceptance of the "rule of thumb" method utilised by Jemena in its submission, the adoption of the same method by the AER for the manipulation of UE data and also its "random" judgement that the allocation of 10% of all fire starts as unreported was reasonable[12].

It appears that the AER had three main concerns with the method proposed by UE as follows:

- The large number of "potential" fire starts identified by UE.
- The fact that this number exceeded the number of fires reported for the same period.
- The potential for "significant inaccuracies" in the uplift due to allocation of incorrect percentages against such a large number of potential fire starts.

The AER is heavily reliant upon the "robustness" of the reported fire start information yet on the other hand chooses to disregard the potential fire start causes (as developed by UE) derived from the same system.

In that context, it is considered that the observation by the AER that the number of unrecorded fires under any category should not be larger than the recorded ones is, at best, questionable[13].

4.4 Recording and Manipulation of Data

As discussed in section 4.1 of this memorandum, the DNSPs' data collection systems are designed primarily to collect reliability related data and hence are neither structured towards, and nor are they completely effective at the recording of fire starts. As such, fire start information derived from the systems as well as the statistics applied (to them), are subject to a range of uncertainties. Accordingly, it follows that a range of outcomes may well be valid depending upon the statistics applied.

This is best illustrated by the application of a sensitivity analysis to the uplift factors used by United Energy. The analysis showed that application of a negative variation of 1% would result

[11] See submission by United Energy, Further information pertaining to United Energy's response to the F-factor Regulatory Information Notice (RIN): The determination of uplift coefficients, 20th September 2011.

[12] AER, *Draft determinations and Explanatory statement for the draft determinations, F-factor scheme determinations 2012-15 for Victorian electricity distribution network service providers*, Australian Energy Regulator, 5th October 2011; section 3.1.5.2, page 18.

[13] Ibid., section 3.1.5.2, page 17.

in an annual uplift of 16.4 fires (annual target of 129.6) and a negative variation of 2% would result in an annual uplift of 12.6 fires (annual target of 125.8). Conversely the application of positive variations of 1% and 2% resulted in annual uplifts of 24.2 (annual target 137.4) and 28.2 (annual target 141.4) respectively.

In light of the impending implementation of the f-factor scheme it is suggested that the effectiveness of the recording of fire starts be enhanced in order to remove the subjectivity and uncertainty inherent in the current system, as has been described above.

5. Conclusions

Based on the review of the relevant documentation including the draft determination by the AER the following conclusions are drawn:

5.1 Data

The AER's heavy reliance on the "robustness" of the data collection process and on the ability of the system to report fire starts accurately and consistently, is flawed. Energy Transfer Solutions considers that the draft determination by the AER fails to take into account the potential for the number of unreported fires to be significantly greater than the estimate obtained by a simple extrapolation of the figures in the faults database.

5.2 Method of Assessment of Unreported Fire Starts

The "preference" by the AER for the method submitted by Jemena to account for unreported fires is unsupported by theoretical argument or empirical analysis. The approach is akin to a generic "rule of thumb".

Its application by the AER to the data supplied by UE to draw conclusions on the number of unreported fires in the UE is inappropriate. In particular the validation of the method by the AER through comparison of the results obtained with taking 10% of all fire starts has not been supported by any data or statistics. Additionally, the fact that the AER did not choose to check its validation against the previous results obtained for Jemena illustrates inconsistency on the part of the AER and surely casts doubt over the results.

5.3 UE Model

Whilst the method initially applied by UE for the assessment of unreported fire starts appears to offer more of a scientific basis than either of those used by the AER (Jemena method and the flat 10% of all fire starts), in the context of the uncertainties within the fire start data and the statistics applied, the outcome is still subjective and, as explained in section 4.4, is more likely to produce a range of outcomes rather than a definitive number.

It is worthy of note that even with a negative variation of up to 2% applied to the UE fire start data the resultant number of annual fire starts exceeds those allocated to UED by the AER in its draft determination and suggests that the number of fire starts proposed by the AER for UE may be low.

5.4 Fire Start Recording

The effectiveness of the DNSP reliability based system for recording of fire starts is questionable and inevitably leads to uncertainties with the fire related data. With the implementation of the f-factor scheme it is important that fire start incidents are captured and recorded accurately.

To that end it is suggested that a means for recording of fire starts and related details would be invaluable for both statistical analysis and as an additional tool for UE to assist with the effective management of its assets.

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