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Electrical Safety and Technical Regulation

Validation Report for the Jemena 2016-2017 Fire Start Report

Document information

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Important notice from Energy Safe Victoria regarding this document

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Introduction

Background

The Victorian Governor in Council made the Order in Council for the F-Factor Scheme Order 2016 under section 16C of the *National Electricity (Victoria) Act 2005*. This was gazetted on 22 December 2016.

The f-factor scheme is managed by the Australian Energy Regulator (AER). Section 7 of the Order in Council identifies that the AER may request Energy Safe Victoria (ESV) to validate the fire start reports submitted to the AER by the Distribution Network Service Providers. Each fire start report will have an individual validation report.

The Order in Council stipulates that each Distribution Network Service Provider (DNSP) will provide a fire start report to the AER by 30 September each year. The Order in Council also stipulates that, if requested by the AER, ESV will provide a validation report to the AER by 30 November each year.

The Order in Council also identifies that the AER may refer any submissions regarding the validation reports to ESV in order to provide a revised validation that responds to the submissions by 15 February in the following year.

Request from AER

The AER wrote to Paul Fearon, Director of Energy Safety, on 3 October 2017 to formally request that ESV validate the 2016-2017 fire reports provided by the DNSPs (AER ref. 62035). The AER also provided the following documents for the validation assessment:

- Cover letter - JEN fire start report — PDF document
- JEN fire start report for the 2016-17 reporting period — PDF document
- Attachment 1 - Regulatory templates — Excel spreadsheet
- Attachment 2 - Review report (confidential) — PDF document
- Attachment 3 - Statutory declaration (confidential) — PDF document

The AER advised ESV that, where necessary for the purposes of validation, ESV should seek additional information directly from the DNSPs. This is in line with clause 7(4) of the Order in Council. Where additional information was sought, ESV ensured that the AER was copied into any correspondence.

Validation process

While the scope of the fire start report and the validation process are detailed in the Order in Council (as outlined below), the approach to be undertaken in assessing the accuracy of information provided is not specified. This section describes the process that ESV applied to the validation assessment; the results are provided later in this report.

Scope

In reviewing the information provided in a DNSP's fire start report, clause 7(3) of the Order in Council stipulates that ESV's validation report:

(b) must include an assessment of the accuracy of the information provided in the fire start report pursuant to clauses 6(3)(d)-(f) and (h), specifically:

(c) must verify the estimate of the ignition risk unit (IRU) amount for the financial year provided under clause 6(3)(g).

These specific items are detailed in clause 6(3) of the Order in Council, which states that a DNSP's fire start report must, among other things:

(d) if the Distribution Network Service Provider is the service provider in relation to more than one distribution system, distinguish between distribution systems;

(e) list all fire starts for a financial year, stating in each case and where known;

(i) what kind of fire start it was;
(ii) the date, time and latitude and longitude for each fire;
(iii) the unique identification number of the pole and polyphase electric line nearest to the fire start;
(iv) the voltage of the electric line in which the ignition occurred;
(v) the estimated value of the fire start expressed in IRUs, calculated in accordance with this Order;

(f) state whether the fire was reported to a relevant entity;

(g) calculate the total IRU amount for the financial year on the basis of the information contained in the fire start report, in accordance with this Order;

(h) include such other information as the AER may from time to time specify;

Clause 6(3) of the Order in Council also requires that the DNSP's fire start report:

(i) include an independent audit of the fire start report undertaken by an external auditor;

(i) stating, in the auditor's opinion, whether the information contained in the fire start report is accurate and reliable; and
(ii) which is acceptable to the AER.

Methodology applied

For its validation assessment, ESV broke these items into the two categories:

- *IRU-specific factors*

  These comprise those factors within the fire start report that are directly relevant to the calculation of the IRUs for the incident. Specifically these are the date, time and latitude and longitude for the fire and the distribution business' estimate of the IRUs for the fire [items (e)(ii) and (e)(v) in the Order in Council].

- *Non-IRU factors*

  These comprise all other information reported in the fire start report [items (e)(i), (e)(iii) and (e)(iv)].

A more detailed analysis was undertaken of the IRU-specific factors than of the non-IRU factors.

ESV validated the DNSP fire start reports as follows:

- *Preliminary review*

  The purpose of the preliminary review was to determine that the information provided to ESV was complete and in a satisfactory form for ESV to undertake its validation analysis.

  ESV started by reviewing the documentation provided by the AER to ensure that all relevant information was provided and readable.

  The DNSP's fire start spreadsheet was then subject to a preliminary, high-level review to ascertain whether there were any obvious issues with the information contained therein. If the preliminary review identified any issues, ESV would contact the DNSP so that the DNSP could provide an updated spreadsheet.

- *Completeness assessment*

  The purpose of the completeness assessment was to determine whether:

  - all fires in the DNSP's fire start report are listed as fires in OSIRIS[1]
  - all network-related fires listed in OSIRIS are included in the DNSP's fire start report.

  Where there were differences identified, ESV contacted the DNSP to confirm the reasons for the difference.

  The DNSP then provided a rationale for the differences and, where there was a change to the information in the fire start spreadsheet, the DNSP provided an updated spreadsheet reflecting any changes and, in some instances, additional supporting information.

  We reviewed the rationale and information subsequently provided by the DNSP to confirm we were satisfied with the reasons for the inclusion or exclusion of specific incidents.

- *Comparative analysis — IRU-specific factors*

  The purpose of the comparative analysis of IRU-specific factors was to identify any *material* differences between the information reported by the DNSP in its fire start report and through OSIRIS. In determining materiality, ESV considered whether:

  - any differences in the location were sufficient to result in a lower location multiplier being applied to the fire start
  - any differences in the location were sufficient to result in an incorrect CFA region being used for determining the applicable Fire Danger Rating for the fire start
  - any differences in the date and time were sufficient to result in an incorrect Fire Danger Rating being applied to the fire start.

  Where potentially material differences were identified, ESV contacted the DNSP to confirm the reasons for the differences.

  The DNSP then provided a rationale for the differences and, where there was a change to the information in the fire start spreadsheet, the DNSP provided an updated spreadsheet reflecting any changes and, in some instances, additional supporting information.

  We reviewed the rationale and information subsequently provided by the DNSP to confirm we were satisfied with the rationale and information provided.

[1] OSIRIS is ESV's incident reporting portal for the major electricity companies to report details of any serious electrical incidents to ESV. These incidents include a range of events that include fires involving network assets.

- *Comparative analysis — non-IRU factors*

  The purpose of the comparative analysis of non-IRU factors was to identify any differences between the information reported by the DNSP in its fire start report and through OSIRIS.

  Where differences were identified, ESV has identified these in this report. No further consultation with the DNSP was undertaken.

Following the validation process, ESV then used the final data to calculate an IRU amount for each fire start. We then compared these against the IRU amounts provided by the DNSP, and a total IRU amount was calculated.

Caveats

The following caveats apply to the validation process and the contents and findings of this report:

- *Accuracy of the fire start data*

  The validation process involves the comparison of two data sets — the DNSP's fire start report and incident data reported by the DNSP via ESV's OSIRIS. Where there are discrepancies between the data reported in these two data sets, ESV has not sought to ascertain which data set provide the true and accurate record of each fire start for the purposes of this report; however, we will pursue this in subsequent discussions with the DNSP.

  As such, ESV can only attest that the data provided in the fire start report is appropriate for the purposes of calculating the total IRU amount. The information provided in the DNSP's fire start report should not be used for other purposes without further analysis of the data to verify it is fit for such purposes.

- *Validation against third-party sources*

  ESV has not sought to validate or verify the data in the DNSP's fire start report in its entirety against third-party sources such as the Country Fire Authority (CFA) and Melbourne Metropolitan Fire Brigade (MFB).

  This is not deemed to be a significant limitation on the validation process as any fires involving network assets should be reported by the CFA/MFB to the DNSP and these are, in turn, reportable to ESV.

  Individual records may have been subject to confirmation with the CFA and/or MFB on a case-by-case basis. If this has occurred, it is noted within the report.

- *Independent verification of fire starts*

  ESV does not have the resources available to routinely undertake independent assessments of the DNSP's electricity network in order to ascertain whether the DNSP identifies all incidents, including fires. As such, the fire starts may be under-reported; however, we are confident that the number of such incidents is small and that no significant fires could have gone unreported.

  Similarly ESV has not undertaken an independent audit of the DNSP's records to ensure their accuracy. In this regard, we have relied on this being undertaken as part of the independent audit commissioned by the DNSP, the details of which were submitted as part of the fire start report.

Accuracy of information provided

ESV undertook an assessment of the accuracy of the information provided in the Jemena fire start report in accordance with clause 7(3)(b) of the Order in Council. The following sections outline the findings of the assessment.

Further details regarding the specific incidents reported in the fire start report are available upon request.

Preliminary review

Upon receipt of Jemena's documentation, we undertook a preliminary review to ensure that all the required documents had been provided to ESV and that the fire reporting spreadsheet had no obvious issues with regard to incomplete or incorrect data.

No high-level issues were identified with the documentation provided by Jemena.

Completeness assessment

We compared the records provided in the Jemena fire start spreadsheet with those available from ESV's OSIRIS incident reporting portal. This comparison was undertaken to assess the completeness of the fire start report, with specific attention paid to identifying any records missing from either data set or classified differently between data sets.

The analysis identified eight incidents where there were discrepancies between the Jemena fire start report and ESV's OSIRIS records. Details are provided in Table 1.

ESV wrote to Jemena on 31 October seeking clarification of the incidents identified in Table 1.

On 3 November, Jemena provided a detailed response for each incident, including supporting evidence. This confirmed the accuracy of the Jemena fire start report. No update of the Jemena fire start spreadsheet was required.

Comparative analysis — IRU-specific factors

We compared the location (latitude and longitude) and timing (date and time) of each record in the fire start report with the record of the same incident in OSIRIS.

As we recognised that errors may be introduced into the location data due to rounding errors and other system-induced errors, we rounded all latitudes and longitudes to five decimal places to reduce the impact of such errors on the analysis.

The subsequent comparison of the records found extensive discrepancies in both the location and timing data — 95% of incident locations and 50% of incident times differed between the data sets. Further statistics on these discrepancies are provided in Table 2.

ESV will be following up with Jemena regarding these discrepancies as a separate matter after completion of the f-factor reporting process.

Table 1 Discrepancies between fire start report and OSIRIS

OSIRIS report no.	Included in fire start report	Listed as fire in OSIRIS	Comment
20161229JEM_02 20170124JEM_01	✓	×	Incidents not listed in OSIRIS as fires. OSIRIS reports re-opened for Jemena to update. No impacts on f-factor validation process.
20170312JEM_01 20170325JEM_03	×	✓	Incidents listed in OSIRIS as fires, but not included in fire start report. Review of incidents identified the faults only involved melting and possible sparking, with no evidence of fire. As such, they are not reportable to the AER. OSIRIS reports re-opened for Jemena to update. No impacts on f-factor validation process.
20170130JEM_02 20170210JEM_03 20170406JEM_02 20170406JEM_04	×	✓	Incidents listed in OSIRIS as fires, but not included in fire start report. Further review by Jemena identified that these incidents were included in its fire start report for the 2016 transitional period. Jemena also noted that the dates listed in OSIRIS for these incidents are incorrect and need to be updated. Jemena provided a copy of its 2016 fire start report as evidence. OSIRIS reports re-opened for Jemena to update. No impacts on f-factor validation process.

Table 2 Discrepancies in location and timing data

Statistic	Location data	Timing data
Number of records	20	20
Number of discrepancies	19 (95%)	10 (50%)
Minimum discrepancy	7.9 m	1.0 min
Maximum discrepancy	357.6 m	238 min
Average discrepancy	45.0 m	76.2 min
Median discrepancy	16.2 m	34.0 min

While there was a high level of difference between the data sets, ESV focused its analysis on those records where the differences could materially affect the IRU calculated for the fire start.

ESV applied the following tests to determine if the differences between the data sets could be material:

- Test 1 : Is the difference in coordinates sufficient that a change in location may result in a higher location multiplier being applied?

  This was assessed by calculating the distance between each location in the fire start report and the nearest boundary to a region where a larger location multiplier[2] would apply (the buffer distance). If the difference in coordinates multiplied by 1.1 was greater than the buffer distance, the record was flagged for further discussion with the DNSP. [3]

  Thus, the materiality in Test 1 is not solely a function of the size of the difference in coordinates, but is more directly influenced by where the incident occurs (together with the size of the difference). Those events closer to boundaries are more likely to be flagged for further assessment; those events with large differences, but far from a boundary, are less likely to be flagged.[4]

- Test 2 : Does the Fire Danger Rating applicable at the location and time for a record differ when based on the information specified in the fire start report and in OSIRIS?

  ESV determined the applicable CFA region for each record by using the EM-COP website to check the CFA region at the OSIRIS coordinates.[5] We then ascertained the Fire Danger Rating based on that CFA region and the date and time data from OSIRIS. These were then compared against the Fire Danger Ratings specified in the DNSP's fire start spreadsheet and differences identified for further investigation.

  Thus, the materiality in Test 2 could either be due to a difference in the location or time data.

  ESV identified that the cause of some differences may be due to the DNSPs assuming that a Fire Danger Rating does not apply at the location because the CFA has not yet declared the fire danger period for the municipality in which the fire occurred. Given the Fire Danger Rating is forecast by the Bureau of Meteorology for large regions covering multiple municipalities, it is possible that a Fire Danger Rating has been forecast for the region before the fire danger period is declared for the municipality. ESV has reviewed the Order in Council and concluded that it is irrelevant to the calculation of the IRU amount whether or not the CFA has declared the fire danger period for municipality. It only matters that a Fire Danger Rating has been forecast for the region.

Using these two tests, we identified those records where the differences in information have the potential to materially affect the IRU for the fire start (Table 3). ESV wrote to Jemena on 23 November seeking clarification of these items.

On 24 November, Jemena wrote to ESV confirming that the location information provided in its fire start report was the most recent and correct data following an internal incident investigation. Jemena also provided further confirmatory information, including photographic evidence of the damage and pole asset number and details of the location from its Geographic Information System. No updates to the fire start report were therefore required.

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2 These regions are specified in clause 11(b) of the Order in Council.

3 Given that distance between points on the globe is dependent on the latitude and longitude of the points, we calculate the approximate difference in meters using latitude and longitude conversion factors based on a central location. We then included a further 10 per cent margin to allow for approximations in the calculation.

ESV believes that the use of an approximation is acceptable for the general purpose of identifying records for further analysis.

4 As noted earlier, ESV will follow up with Jemena as a separate process.

5 Emergency Management Common Operating Picture (https://cop.em.vic.gov.au).

Table 3 Discrepancies potentially material to calculation of the IRU amount

Incident number	DNSP fire start report			OSIRIS data		
	latitude	longitude	date/time	latitude	longitude	date/time
20170322JEM_01	-37.81464	144.85771	22/03/2017 04:11	-37.8115	144.85861	22/03/2017 04:11

Comparative analysis — non-IRU factors

ESV undertook a comparison of the data in the Jemena fire start report and OSIRIS related to:

- the kind of fire start
- the pole and polyphase electric line identifications numbers
- the voltage of the electric line.

Details from OSIRIS on the asset involved and the incident description were used to determine whether the kind of fire start had been correctly identified. This involved a subjective assessment of the information.

A direct comparison was made of the details of the pole and line identification numbers and line voltage in the fire start report and OSIRIS. This did not require any subjective assessment.

The assessment of ESV fire start category found no discrepancies with the fire categories reported in the Jemena fire start report. We then used the ESV fire start category data to determine the broader fire start type as defined in Clause 5 of the Order In Council. This identified twelve discrepancies in the fire start types assigned by Jemena. In all instances Jemena had classified the fire type as ''Started by any other thing forming part of or coming into contact with a distribution system'' whereas ESV categories the fire type as ''Started in or originated from a distribution system''.

ESV found discrepancies in the pole identification for sixteen of the twenty fire starts. Of these, two records had different pole identification numbers (incidents 20161221JEM_01 and 20170205JEM_01) and fourteen were where no pole identification number was provided in OSIRIS.[6]

ESV also found discrepancies in the polyphase electric line identification for nine of the twenty fire starts. Of these, one record had a different line identification number (incident number 20170116JEM_03) and eight were where no line identification number was provided in OSIRIS.[6]

No mismatches were found in the line voltages reported.

These discrepancies had no material impact on the total IRU calculation.

No consultation was held with Jemena regarding these discrepancies.

[6] Pole and line identification numbers are currently non-mandatory fields in OSIRIS.

Verification of IRU amount

Following the validation of individual records, ESV compiled any changes to the fire start records and assigned the corresponding location and danger multipliers. In assigning multipliers, ESV corrected the danger multiplier formula in the AER template spreadsheet to ignore whether the CFA had declared the fire danger period for the municipality. The individual and total IRU amounts were then calculated.

We then compared our location and danger multipliers with those of Jemena to determine whether Jemena had correctly assigned the multipliers for each fire start. As noted previously, there were no material discrepancies in the Jemena fire start data. ESV found that Jemena had also assigned the multipliers correctly.

ESV can therefore confirm that the total IRU amount of 1.88 provided in the Jemena 2016-2017 fire start report[7] is correct.

[7] As per Attachment 1 - Regulatory templates.xlsm

Conclusion

As noted earlier, the Order In Council stipulates that this validation report:

(b) must include an assessment of the accuracy of the information provided in the fire start report pursuant to clauses 6(3)(d)-(f) and (h), specifically:

(c) must verify the estimate of the ignition risk unit (IRU) amount for the financial year provided under clause 6(3)(g).

Table 3 identifies where these items have been assessed within this report and summarises the key findings of the validation assessment.

Table 3 Summary of findings

Statistic	Relevant report section	Key findings
Clause 6(3)(d)	Request from AER	The fire start report only addressed the Jemena distribution system.
Clause 6(3)(e)(i)	Comparative analysis — non-IRU factors	There were no discrepancies between the assessment of the ESV fire category made by Jemena and that made by ESV. There were twelve discrepancies in the fire type assigned by Jemena. These discrepancies were not material to the calculation of the total IRU amount.
Clause 6(3)(e)(ii)	Comparative analysis — IRU-specific factors	While there were a significant number of differences between the fire start report and OSIRIS data sets, none of these discrepancies was material to calculation of the total IRU amount.
Clause 6(3)(e)(iii)	Comparative analysis — non-IRU factors	There were sixteen discrepancies between the fire start report and OSIRIS in relation to pole identification number. There were nine discrepancies between the fire start report and OSIRIS in relation to polyphase electric line identification number. These discrepancies were not material to the calculation of the total IRU amount.
Clause 6(3)(e)(iv)	Comparative analysis — non-IRU factors	There were no discrepancies between the fire start report and OSIRIS in relation to voltage of the line involved in the fire.
Clause 6(3)(e)(v)	Verification of IRU amount	The total IRU amount of 1.88 provided in the Jemena 2016-2017 fire start report is correct.
Clause 6(3)(f)	Completeness assessment	Jemena had reported all fires to ESV as the relevant entity.