Information Document
Event Notification, Reporting and Analysis
ID #2016-002R

Information Documents are not authoritative. Information Documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an Information Document and any Authoritative Document(s)[1] in effect, the Authoritative Document(s) governs.

1 Purpose

This Information Document relates to the following Authoritative Documents:

- Section 304.7 of the ISO rules, *Event Reporting* ("Section 304.7");
- Section 304.8 of the ISO rules, *Event Analysis* ("Section 304.8");
- Section 305.4 of the ISO rules, *System Security* ("Section 305.4"); and
- Alberta Reliability Standard PRC-004-WECC-AB1-1, *Protection System and Remedial Action Scheme Misoperation* ("PRC-004-WECC-AB1-1").

The purpose of this Information Document is to provide guidance to market participants on providing notifications, event reporting, event analysis and misoperation reporting to the AESO.

2 Notification, Event Reporting, and Event Analysis

Notifications to the AESO under Section 305.4 are made in real time to ensure that the AESO is aware of potential circumstances that could adversely affect the transmission system or transmission system control facilities.

An event report under Section 304.7 is provided after an event has occurred. Event reports create awareness for the Alberta electric industry so impacted parties can mitigate potential reliability risks. Event reports also support the AESO in identifying emerging reliability concerns.

An event analysis request may be carried out following an event in accordance with Section 304.8. The analysis process promotes an objective review by the AESO or a market participant to evaluate the event's impact on the reliable operation of the Alberta Interconnected Electric System (AIES).

Event reports and event analysis do not apply to planned outages which are submitted to the AESO under Section 306.4 of the ISO rules, *Transmission Planned Outage Reporting and Coordination,* or Section 306.5 of the ISO rules, *Generation Outage Reporting and Coordination*.

3 System Security – Notifications (Section 305.4)

Market participants are expected to advise the AESO of any circumstances that could adversely affect system security[2], or the ability of the AIES to deliver energy, pursuant to Section 305.4.

A notification under subsection 3 of Section 305.4 is made by real time verbal communication to the AESO system controller. These notifications communicate conditions that are unplanned or that vary from the planned conditions for the AIES. Notifications provide situational awareness to the AESO system controller with respect to the real time condition of the AIES. Market participants are encouraged to provide all available information when notifying the AESO, including, but not limited to:

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[1] "Authoritative Documents" is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. Authoritative Documents include: the ISO rules, the Alberta reliability standards (ARS), and the ISO tariff.

[2] Refer to AESO's Consolidated Authoritative Document Glossary (CADG) for the definition.

(a) a description of the conditions; and

(b) the anticipated duration of the conditions.

The following are examples of situations in which market participants may consider notifying the AESO system controller of a circumstance under subsection 3 of Section 305.4:

(a) Any change or potential change in the status of transmission lines and substations that could affect the reliability of the AIES. This may include, but is not limited to, a change in the status of protection systems, outage duration, remedial action schemes (RAS) or communication capability.

(b) Events or circumstances relating to the market participant's facilities that could affect the reliability of the AIES. This may include, but is not limited to, adverse weather conditions, fires or bomb threats.

(c) Forced outages of transmission lines or substation equipment that could affect the reliability of the AIES regardless of whether it would cause an interruption of service to customers.

Event notifications under Section 305.4 may also be the subject of event reports under Section 304.7, event analysis under Section 304.8, or PRC-004-WECC-AB1-1.

4 Event Reporting (Section 304.7)

The AESO expects market participants to report qualifying events as outlined in Section 304.7. Reportable events typically occur when an energized system element is isolated, taken out of service, deenergized etc., as a consequence of the event.

The AESO encourages market participants to carefully review the event descriptions in appendices 1, 2 and 3, and subsection 7 of Section 304.7 to determine if an event is reportable.

- As per subsection 7 of Section 304.7, theft events only require reporting to the ISO and other agencies (PSIO, RCMP, and local police) if the responsible entity determines that the theft degrades the normal operation of the transmission facility, generating unit, aggregated facility, or energy storage resource.
- Physical threat events are only reportable if they have the potential to degrade normal operation of the control centre, transmission facility, generating unit, aggregated facility, or energy storage resource.

Market participants report the details of events in Appendices 1 to 3 to the AESO using the *Event Reporting Form*[3], which is available on the AESO's Section 304.7 webpage.

The AESO encourages users to download the latest version of the form each time an event is reported.

The form may be emailed to:

(a) both security@aeso.ca, and opsevents@aeso.ca - for the following events, *only if* a direct and immediate operational impact is caused:

(i) Physical threat to a facility;

(ii) Physical threat to a control center; and

(iii) Damage or destruction by intentional human action, including theft, at a facility.

[3] Hyperlinks may change periodically.

(b) security@aeso.ca, for events below:

(i) Suspicious device or activity at a facility – 100 kV or higher; and

(ii) Suspicious device or activity at a control center.

(c) opsevents@aeso.ca for all other events (in Appendices 1 and 2).

4.1 Additional Reporting to PSIO, RCMP, and Local Police

Responsible Entities are also obliged to report certain events in Appendices 1 and 3 to the following bodies:

- Provincial Security and Intelligence Office (PSIO);
  - PSIO-Intelligence@gov.ab.ca, or (780) 644-2680;
- The RCMP; and
- The local police (where applicable).

4.2 Protection System Misoperation Reporting (Section 304.7 and PRC-004-WECC-AB1-1)

Failure or misoperation of a protection system or remedial action scheme that impacts the transmission system is a reportable event under Section 304.7, these include but are not limited to:

(a) The failure or misoperation of a protection system, excluding the related telecommunications that protects a transmission facility greater than 200 kV, regardless of whether a functionally equivalent protection system remains in service;

(b) The failure or misoperation of a protection system, excluding the related telecommunications that protects a transmission facility where a functionally equivalent protection system is not available;

(c) The failure or misoperation of a teleprotection communication channel, where there is an equivalent backup teleprotection communication channel, and where the failure lasts for more than 24 consecutive hours; or

(d) The failure or misoperation of a teleprotection communication channel, where there is no equivalent backup teleprotection communication channel, and where the failure lasts for more than 10 consecutive minutes.

Additionally, PRC-004-WECC-AB1-1 requires the submission of a misoperation incident report within six business days of:

- Identification of a misoperation of a protection system and/or RAS.
- Completion of repairs or the replacement of a of a protection system and/or RAS that mis operated.

Misoperation incident reports under PRC-004-WECC-AB1-1 can be emailed to opsevents@aeso.ca. Market participants are encouraged to use the Event Reporting Form for initial notification of the event.

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5 Event Analysis (Section 304.8)

The purpose of this ISO Rule is to promote a structured and consistent approach to event analyses in Alberta that aligns with the NERC's Electric Reliability Organization Event Analysis Process.[4] Event analysis involves identifying what happened, why it happened, and what can be done to prevent a reoccurrence.

5.1 Event Categories

In accordance with subsection 2(3) of Section 304.8, when the AESO conducts an event analysis, the AESO may categorize the event according to Appendix 1, where Category 1 is the lowest and Category 5 is the highest. The events listed in Appendix 1 are not exhaustive and the AESO categorizes events based on their impact to the reliability of the AIES.

5.2 Cause Codes

Event analysis reports use "cause codes" to identify characteristics and attributes of events. Cause coding provides a structured, measurable, and continuously improvable approach to tracking the causes of reportable events. This supports trend analysis and the development of actionable transmission system risk reduction knowledge.

Responsible Entities are encouraged to use the NERC's *Cause Code Quick Reference* available on the NERC website. These codes may be updated from time to time.

For further information on cause codes, Responsible Entities may review the *NERC Cause Code Assignment Process* and *Root Cause Analysis Methods for NERC, Regional Entities, and Registered Entities*, available on the NERC website.

5.3 Lessons Learned

The AESO may determine a lessons-learned document should be prepared and shared with the industry to facilitate the reliability of the AIES, based on the findings of an event analysis. The AESO prepares Lessons-Learned documents using the NERC template.

The lessons-learned document is reviewed by the AESO, and the Responsible Entities involved in the event for completeness prior to posting on the AESO website.

5.4 Reports

Depending on the nature of the event, the AESO may request a full event analysis report, a brief report, or both from a market participant, pursuant to subsection 3 of Section 304.8. For such requests, the AESO indicates the event category and type of report to be provided.

When a Responsible Entity requests that the AESO provide an extension to the timeframes indicated in subsection 4(1) of Section 304.8, the AESO will provide a written response to the extension request.

Where multiple Responsible Entities are involved in an event, or if portions of the event apply only to the AESO, the AESO may prepare a brief report or event analysis report which summarizes information received from Responsible Entities, pursuant to subsection 6(1) of Section 304.8.

The NERC or the WECC can request the reports and documents as described in Section 304.8 through opsevent@aeso.ca.

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[4] Materials relating to the NERC's Electric Reliability Organization Event Analysis Process are available on the NERC website at the following link: http://www.nerc.com/pa/rrm/ea/Pages/EA-Program.aspx.

5.4.1 Full Event Analysis Report

An event analysis report will typically be requested by the AESO for more significant events (Category 3 and above) but may also be requested for lower category events.

Upon the AESO's request, a Responsible Entity prepares an event analysis report using the Event Analysis Report Template available on the NERC's website.

A Responsible Entity may consider the following guidance when completing the Event Analysis Report Template:

1. **Report Cover Sheet**
   a. Reported Event Title used to further identify the event (provided by the AESO in its request), including the date of the event (YYYYMMDD), entity, substation or location as appropriate;
   b. Date of Report;
   c. Responsible Entity; and
   d. Individual preparing the report.
2. **Table of Contents**
3. **Executive Summary**
4. **Event Overview**

   A description of the pertinent facts related to the event, including pre and post event periods.
5. **Sequence of Events**

   A sequence of events includes the date, time and duration (until restoration) of the event. This timeline is a building block for all other aspects of the analysis and is a starting point for the root cause analysis.
6. **Root Cause Analysis**
   a. A list of the causal factors of the event. The root cause analysis is a factual record to support the conclusions in the report; and
   b. Assign cause code (assigned by the Responsible Entity).
7. **Detailed System Analysis**
   a. System conditions prior to the event;
   b. Generation outage summary (relevant outage, planned or unplanned);
   c. Transmission outage summary (relevant outage, planned or unplanned);
   d. Effect on other entities and customers (MW lost), for the following:
      i. Load (both DOS and DTS): include the number of customers affected and how long they were without service if this information is available; and
      ii. RAS, including the number of generators and customers affected, and the duration of interrupted service, if available.
   e. Event response; and
      i. Frequency excursions: frequency plot, from T-0 until the frequency reached steady-state;

ii. Under-frequency load shed (UFLS): details of operation, including what blocks were shed and the MW per block;

iii. Voltage excursions: voltage plots, from T-0 until the voltage reached steady-state;

iv. Digital fault recording[5];

v. Protection schemes (including RAS): operation with respect to design;

vi. Details of any equipment malfunction that contributed to the disturbance, or equipment damage resulting from the disturbance;

vii. SCADA information; and

viii. Restoration observations.

8. Findings, Conclusions, and Recommendations

a. Specific findings and conclusions;

b. Recommendations including corrective actions, lessons learned and good industry practices; and

c. A lesson learned is knowledge or understanding gained by experience that has a significant impact for an organization. The experience may be either positive or negative. Successes are also sources of lessons learned.

9. Appendices

Responsible Entities are encouraged to include the following in an event analysis report:

a. Single line diagrams;

b. Graphic representations (see event response in 7(e) above);

c. Team members contributing to the report preparation; and

d. Other relevant data.

5.4.2 Event Analysis - Brief Report

Upon the AESO's request, a Responsible Entity prepares a brief report using the Brief Report Template located on the NERC's website.

A Responsible Entity may consider the following guidance when completing the Brief Report Template:

1. Reported Event Title

Title used to further identify the event (provided by the AESO in its request), including the date of the event (YYYYMMDD), entity name, substation name or location as appropriate.

2. Submittal Date

Date brief report was submitted. Include a subsequent submittal date if updated.

[5] In most cases printed traces from digital fault recording are adequate. However, if digital files are provided it is recommended that, to the extent possible, the disturbance data be reported in a format capable of being viewed, read and analyzed with a generic COMTRADE (according to the current edition of IEC 60255-24,Measuring relays and protection equipment - Part 24: Common format for transient data exchange (COMTRADE) for power systems) analysis tool, and that the data files be named in conformance with the IEEE C37.232-XXXX Recommended Practice for Naming Time Sequence Data Files.

3. **Entity Name** (*Item 1)*

   Responsible Entity submitting the report.

4. **Brief Description** (*Item 4)*

   A summary of what, when, where and how it happened, as applicable. It does not need to describe the causes and conditions surrounding the event, if unknown at the time of reporting.

5. **Proposed Event Categorization** (e.g., 1a, 2b)

   See the list of categories in Appendix 1 of Section 304.8.

6. **Items 6 - 12**

   If the event did not involve generation, frequency, transmission facilities or load, items 6 - 12 may be left blank.

7. **Generation Tripped Off-line** (*Item 6)*

   Total gross MW loss and names of the units that tripped off-line due to the event.

8. **Outage/Restoration Time** (*Item 12)*

   Total outage time for each affected transmission facility, generating unit, or load, or a time estimate of pending restoration.

9. **Sequence of Events** (*Item 13)*

   A chronological timeline of the events that took place leading up to and through the event for the purpose of causal analysis. This timeline does not include potential causes or narratives identifying the impact of various activities throughout the event.

10. **Narrative** (*Item 17)*

    A detailed description of the event using the sequence of events, single-line diagrams, available data and any assumptions, as necessary. The narrative explains the “what”, “when”, “how” and “where” aspects of the event in detail, as well as the impact. The narrative describes the potential causes of the event, preventive measures that could have prevented the event, corrective measures taken after the event, and any extent of the conditions identified.

5.5 Completion of Event Analysis

The AESO closes the event analysis upon completion of all associated reports. The AESO may forward the event analysis reports and documents to NERC and the WECC if requested.

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Revision History

Posting Date	Description of Changes
2025-03-24	The event reporting process in section 4 of the ID was updated. Removed (the previous) subsection 4.1 (Transient vs Sustained Forced Outage) for clarity. Additional information related to event analysis was added to Section 6. Other minor changes such as updating references, removing outdated links, and clarity related changes were also made.
2024-08-28	Addition of subsection 4.4 - Replacement of ASSIST with PSIO
2018-04-30	Addition of section 6, Event Analysis
2017-12-12	Clarifying revisions to section 4.2 and administrative revisions
2016-08-30	Initial release