Event Analysis Process

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Events Analysis - Agenda

- Team
- Purpose/Goals
- Process
- Field Trials and Results
- Lessons Learned
- References/Documents
- Compliance Interface
- Question and Answer
- Conclusion
Event Analysis Team

- SPP registered entities
- SPP RE staff
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- NERC Events Analysis staff
- NERC Events Analysis Working Group (EAWG)
Event Analysis Purpose and Goals

• Collaborative approach between registered entities, SPP RE and NERC
  ✓ Promote Bulk Electric System reliability
  ✓ Develop reliability excellence culture
  ✓ Implement corrective actions in timely manner
  ✓ Share knowledge to avoid repeat events
  ✓ Consistency across regions and timely reporting
Event Analysis Process

• **Applicability**
  – Any SPP registered entity that has qualifying BES event

• **Categorization of Events**
  – Five event categories based on BES impact
  – Registered Entity, SPP RE and NERC situational awareness staff agree on category designation
  – Investigation and number of required EA reports increases with increasing event category
Event Categorization

Prioritizes Event Analysis based on risk and significance

Response is systematic and depth of analysis increases as category rises.

- **Cat 4/5**
  - Loss of large amounts of load or generation
  - Large unintended large system separations and islanding

- **Cat 2/3**
  - Loss of a generation stations, loss of small to medium amounts of load
  - Unintended system separations and islanding

- **Cat 1**
  - Unintended loss of bulk power elements (gen, transmission components, intended or controlled separations)
Event Analysis Process

• Most weather events are not subject to EA process

• Reporting process
  – Initial reports should be sent to sppevents@spp.org within 24 hours (SPP Criteria 11)
  – SPP RE EA team will follow-up via phone or email
    ▪ Official EA request will include a data hold if event is Category 2 or above
  – Number of reports and level of detail increases according to category
Event Analysis Field Trials

• NERC conducted two field trials to test new EA process

• Goals:
  – Develop EA Process that achieves program objectives
  – Results in process documents that will become part of NERC, SPP RE, and entities’ response to events

• Field Trials allowed industry and regional input on EA process and documents

• SPP entities that had a qualifying event participated in Field Trials
Event Analysis Field Trials

• 1st Field Trial for enhanced EA
  – October 25, 2010 - January 25, 2011
  – Industry feedback resulted in category refinements and streamlined process documents

• 2nd Field Trial
  – May 2, 2011 - August 1, 2011
  – Further category refinements expected

• Next Steps
  – Revisions to EA process documents and approval by NERC Board of Trustees and FERC
  – Finalize Lessons Learned from 2nd Field Trial
Field Trial Events by Category

- 414 occurrences recorded during the field trials
- 162 events qualified for review (Cat 1 - 5)
- 7 SPP qualifying events (5 - Cat 1 and 2 - Cat 2)
# Event Analysis Reports and Timelines

Days refer to business days

<table>
<thead>
<tr>
<th>Category</th>
<th>Brief Report</th>
<th>Draft Lesson Learned</th>
<th>Event Analysis Report</th>
<th>Compliance Self-Assessment</th>
<th>Close Event Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Draft to RE in 5 days; final in 10 days</td>
<td>15 days</td>
<td>Not required</td>
<td>Encouraged (submittal not required)</td>
<td>10 days after Brief Report</td>
</tr>
<tr>
<td>2</td>
<td>Draft to RE in 5 days; final in 10 days</td>
<td>30 days</td>
<td>30 days</td>
<td>Initial in 20 days; final 60 days after Brief Report</td>
<td>30 days after EA Report</td>
</tr>
<tr>
<td>3</td>
<td>Draft to RE in 5 days; final in 10 days</td>
<td>30 days</td>
<td>60 days</td>
<td>Initial in 20 days; final 90 days after Brief Report</td>
<td>30 days after EA Report</td>
</tr>
<tr>
<td>4</td>
<td>Draft to RE in 5 days; final in 10 days</td>
<td>60 days</td>
<td>120 days</td>
<td>Initial in 20 days; final 150 days after Brief Report</td>
<td>60 days after EA Report</td>
</tr>
<tr>
<td>5</td>
<td>Draft to RE in 5 days; final in 10 days</td>
<td>60 days</td>
<td>120 days</td>
<td>Initial in 20 days; final 150 days after Brief Report</td>
<td>60 days after EA Report</td>
</tr>
</tbody>
</table>
Lessons Learned

• Industry helping industry learn and improve

• Concise summary of real-world events:
  – Primary Interest Groups
  – Problem Statement
  – Details
  – Corrective Actions
  – Lessons Learned
  – NERC and RE contact

• 28 Lessons Learned from 1st field trial

• 23 Lessons Learned from 2nd field trial

• 7 Lessons Learned from SPP region
NERC Lessons Learned Event Categories

9% Lessons Learned Submitted since Start of the Field Trial
Oct 25, 2010 - June 25, 2011

- Generation Facilities: 57%
- Bulk Power System Operations: 4%
- Communications: 7%
- Facilities Design, Commission and Maintenance: 19%
- Other: 6%
- Training and Personnel: 3%
- Procedural Controls: 3%

Includes 45 (46%) LL from the Sunbelt Cold Snap Event EA
Lesson Learned
Zone 3 Line Relay Mis-operation

Primary Interest Groups:
Transmission Owners
Transmission Operators
Balancing Authorities

Problem Statement
A Zone 3 distance relay mis-operation was responsible for the trip of several transmission lines. There was no actual fault condition at the time of the incident.

Details
For this event it was determined that a single phase electromechanical distance relay phase clutch and the spring mechanism had failed in the Zone 3 element of the distance relay. These relays were recently tested as part of the defined maintenance interval. This entity has seen an increase in failures of this older style mechanical relay over the last 5 years. Most causes are attributed to the age of the relays and the environmental conditions present where they reside.

Corrective Actions
After analysis of the condition, it was determined that the Zone 3 element could not be repaired. A spare relay was refurbished, tested, and the relay was placed back into service.

Lesson Learned
Due to the recent increase in failures the entity is evaluating its relay and testing procedures to determine if increased testing and maintenance is required or replacement of this style relay with newer micro based relays is warranted based on manufacture life cycle recommendations.

For more information please contact:

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SPP Lessons Learned

- **SPP.org>Regional Entity>Event Analysis** contains Lessons Learned from regional events
- Several under development related to generation events, communications, and training
Lessons Learned Process

• Entity completes initial Lessons Learned form, Appendix D
• Entity works with SPP RE to finalize
• SPP RE redacts Lessons Learned and sends to NERC
• NERC EA staff and NERC EAWG review Lessons Learned
  – Standardized format
  – Some editing may occur
  – NERC EA staff finalizes and publishes to NERC.com
NERC.com > EA tab for info and documents

- EA Process
- Lessons Learned
- System disturbance reports
- Field test
EA and Compliance

• Good faith effort to self-identify and self-report any EA-related standard violations is encouraged
  – Many events do not result in any violations
• If the SPP Registered Entity self-reports during the EA process, the SPP RE will give credit to the entity
• SPP RE EA staff does not analyze event for compliance
• SPP RE Compliance staff’s review begins when EA Process concludes
Conclusion

• EA process is a bottoms-up, collaborative approach to understanding what and why a BES disturbance occurred.

• EA process produces Lessons Learned to encourage and disseminate corrective and/or preventative actions to continually improve BES reliability.

• SPP RE and NERC encourage and recognize entities’ self-assessment.

• EA process will become mandatory after NERC Board of Trustees and FERC approval.