Revised Event Analysis Process

Event Analysis Subcommittee (EAS) Process Update Team (EUT)

Sam Holeman – Duke Energy, EAS chair
Hassan Hamdar – FRCC, EAS vice-Chair
Rich Bauer – NERC
August 28, 2013 Webinar
• Welcome and Introduction
• Purpose
• Brief History of ERO EA Process
• Version 2 Update to the EA Process
• Meeting Industry’s expectations
• Questions and Answers
Quick History

- **EA Field Trials Phase I**
  - Implemented October 25, 2010

- **EA Field Trials Phase II**
  - Implemented May 2, 2011

- **Event Analysis Process Version 1**
  - Approved by the NERC Board of Trustees February 9, 2012
  - Implemented on February 21, 2012.
Goals of the EA Process

• Promote Reliability of the Bulk-Power System (BPS)
• Develop a Culture of Reliability Excellence that promotes aggressive critical review and analysis of the event.
• Collaboration between registered entities, Regional Entities, and NERC.
• Being a Learning Organization by disseminating information from event to owners, operators, and users of the BPS.
Industry Participation

- Over 154 registered entities have participated
  - 52 entities have participated more than once
- 57 Lessons Learned (LLs) published since October 2010
  - LLs available on NERC website
- NERC Cause Code Assignment Process values entity participation in the trending of their events
  - Summary information routinely shared with industry
<table>
<thead>
<tr>
<th>Event Category</th>
<th>Count (Total)</th>
<th>Count (2013)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT 1</td>
<td>206</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>CAT 2</td>
<td>102</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>CAT 3</td>
<td>14</td>
<td>6</td>
<td>50% of the Cat 3 events have been driven by nature</td>
</tr>
<tr>
<td>CAT 5</td>
<td>1</td>
<td>0</td>
<td>Hurricane Sandy (2012)</td>
</tr>
<tr>
<td><strong>Total CAT 1-5 Events</strong></td>
<td><strong>326</strong></td>
<td><strong>68</strong></td>
<td><strong>As of 7/31/2013</strong></td>
</tr>
</tbody>
</table>
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The North American Electric Reliability Corporation (NERC) is the mutually recognized reliability organization for North America, subject to oversight by the Federal Energy Regulatory Commission and governmental authorities in Canada. Entities under NERC’s jurisdiction are the owners and operators of the Bulk-Power System, which serves more than 334 million people.
Reliability Risk Management

NERC’s Reliability Risk Management (RRM) group carries out the ERO’s statutory responsibility by performing assessments (including Real-time or near-Real-time assessments) of the reliability and adequacy of the Bulk-Power System and by identifying potential issues of concern relating to system, equipment, entity and human performance that may indicate the possible need to develop new or modified Reliability Standards.

RRM includes four primary functions: (1) Bulk-Power System awareness; (2) event analysis; (3) training; and (4) operator certification. This group focuses directly on proactive awareness of Bulk-Power System conditions.
process for addressing event analysis and provides a robust lessons learned process and feedback exchange among registered entities, NERC and its Regional Entities.

The **ERO Event Analysis Process Document - Version 2** was endorsed by the Operating Council on May 2, 2019.

### EA Program

<table>
<thead>
<tr>
<th>Type</th>
<th>Title</th>
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<tr>
<td>☐</td>
<td>ERO Event Analysis Process Documents - Version 2 (7)</td>
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<tr>
<td>☐</td>
<td>ERO Event Analysis Process Version 1 - Archive Documents (11)</td>
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<td>☐</td>
<td>Field Trial Related Archive Documents (17)</td>
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<tr>
<td>☐</td>
<td>Reference Materials for Cause Analysis Methods and Tools (3)</td>
</tr>
<tr>
<td>☐</td>
<td>Reference Materials for Event Analysis (1)</td>
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<tr>
<td>☐</td>
<td>Related Letters to Industry Stakeholders (2)</td>
</tr>
<tr>
<td>☐</td>
<td>Webinars/FAQ (4)</td>
</tr>
</tbody>
</table>

**Previous System Disturbance Reports**
Event Analysis Process - Update Team

- Team Members
  - Hassan Hamdar – FRCC
  - Jacquie Smith – RFC
  - Brenda Hampton – Energy Future Holdings - Luminant
Revision Process Overview

- EAS member comments
  - Redline developed based on comments
- Redline posted for industry comment
- Review team (EUT) identified the need to streamline based on industry comments
  - Agreement from EAS, NERC Management, and NERC Operating Committee (OC) Executives
- Review by EAS and NERC OC
- Version 2 Approved by NERC OC - June 2013
• EAS members comments based on
  ▪ Working experience
  ▪ Industry feedback
  ▪ Regional input
• EUT developed a redline with the EAS member comments and previous industry comments received throughout
• Redline posted with announcement soliciting comments
Review team identified need to streamline

- Many industry comments related to background and history
  - Can’t change the past
  - Background no longer needed in process document

less words = less pages = less time = clearer process
• Did not change the process
  ▪ Streamline without creating more work

• Clean up language
  ▪ Correct grammar and spelling
  ▪ Slight change to appendices

• Separate document for appendices
  ▪ EAS will be utilizing the NERC website more effectively

• Changes in categories
  ▪ Next slide
Based on comments related to 2b and Energy Management Services Task Force (EMSTF) input

- **New Category 1 for EMS events – Need to learn more**
  - Loss of monitoring or control, at a Control Center, such that it significantly affects the entity’s ability to make operating decisions for 30 continuous minutes or more.
    - *Examples include, but are not limited to the following:*
      - Loss of operator ability to remotely monitor and/or control Bulk Electric System (BES) elements
      - Loss of communications from SCADA RTUs
      - Unavailability of ICCP links reducing BES visibility
      - Loss of the ability to remotely monitor and control generating units via AGC
      - Unacceptable State Estimator or Contingency Analysis solutions

- **Category 2b is still intact**
• Added “Unintended” where needed
• Category 1a – Back to original with slight changes based on comments

1a. An unexpected outage, contrary to design, of three or more BPS Facilities caused by a common disturbance. For example:
   i. The sustained outage of a combination of three or more Facilities.
   ii. The outage of an entire generation station of three or more generators (aggregate generation of 500 MW to 1,999 MW); each combined cycle unit is counted as one generator.
• Removed SOL Violations (WECC Only) in category 2g
  - Interconnection Reliability Operating Limit (IROL) Violation or SOL Violation (WECC only) for time greater than T_v.
• NERC OC
  ▪ Approved June 2013

• NERC PC
  ▪ Shared approved document

• NERC BOT
  ▪ Shared approved document

• Effective Date
  ▪ October 1, 2013
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Quality Reporting is Essential

- Quality of the event analysis report is vital for the success of the NERC Event Analysis program
- Quality, detailed analysis/investigations lead to quality reports
- Good quality event analysis reports allow for more accurate cause coding of events
- Accurate cause coding leads to better trending
- Better trending leads to timely identification of issues being communicated back to the industry

NERC document – Attributes of a Quality Event Analysis Report
Root Cause Determinations

- AZ Information to determine cause Less Than Adequate (LTA)
- A4 Management / Organization
- A2 Equipment / Material
- A1 Design / Engineering
- A7 Other
- A3 Individual Human Performance
- A5 Communication
- AN No Causes Found
Why False Line Out Indication?
Event Analysis Reports reveal 1 other CAT 1 failure of this type in the last year.

Modern devices utilize solid state components to increase capacity and decrease operating time.

These types of contacts are susceptible to false indications when connected to a high impedance input device.
Modern devices utilize solid state components to increase output contact capacity and reduce operating time.

These types of contacts are susceptible to false indication when applied as an input to a high impedance device.

Manufacturers have Application Guides / Warnings on applications utilizing high impedance inputs.

Industry LL has been published:
- Feedback welcome at survey site given on LL.
Why does the 345 kV Breaker Fail?
Why does the 345 kV Breaker Fail?

- Event Analysis Reports reveal 6 other failures of this type in the last year
  - 5 CAT 1
  - 1 CAT 0
- Manufacturer has Maintenance Advisory concerning nozzle failures
- Procedure replaces nozzle and provides increased torque values for retaining bolts
- Based on the number of failures, extent of condition (NERC estimates 1000 breakers) and risk to the BES – A NERC Industry Advisory was issued 8/27/2013
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Resources and Questions

EA Process Documents:

NERC CCAP Document:

NERC EA contact e-mail:
NERC.EventAnalysis@nerc.net

NERC Quality Report document: