

**TO:** NERC Board of Trustees (BOT)



**FROM:** T.J. Galloway, NATF President and CEO

**SUBJECT:** NATF Periodic Update to the NERC BOT – October 2014

Attachments: 1. Summary of NATF / NERC Coordination Topics  
2. NATF near term focus and activities  
3. Protection System Misoperation Reduction Initiative

The North American Transmission Forum (NATF) mission is to promote excellence in the reliable operation of the electric transmission system, with the vision to see reliability continuously improve. As such, the NATF shares many common objectives with NERC. To advance these common objectives, and avoid redundant or conflicting efforts, we have undertaken periodic (roughly quarterly) strategic coordination meetings between the senior leadership of both organizations. The last such meeting was completed June 13, 2014, with the next scheduled for late this year. A summary of the coordination topics and NATF status/actions are presented as attachment 1.

In addition to specific points of coordination, the NATF has a number of activities underway that benefit reliability, security, and resiliency that are likely of interest to the NERC BOT. These activities and initiatives are detailed in attachment 2.

Lastly, NATF provided a briefing on misoperation reduction activities in the August NERC BOT. An update to those activities is provided as attachment 3.

cc:

NERC: G. Cauley, NERC President and CEO; M. Moon, Senior Director  
NATF: R. Carter, K. Berent, C. Sills, Letter Log

**Attachment 1 - Summary NATF / NERC Strategic Coordination Topics**

Topic	NATF Status / Details
345 kV Breaker Alert and follow up activities	Coordination with NATF members and various other groups to promote awareness of NERC 345 kV breaker Advisory and related industry status. Final update was provided in the August 2014 BOT.
Protection System Misoperations	<ul style="list-style-type: none"> <li>• NATF has a longstanding system protection practices group.</li> <li>• A 2013 NATF initiative was created specifically to help reduce misoperations by performing detailed analysis of data from a member subset.</li> <li>• Principle causes identified matched those of the MisOp task force. Namely:               <ol style="list-style-type: none"> <li>1. Relay setting errors</li> <li>2. Communication channel problems</li> <li>3. Relay failures</li> </ol> </li> <li>• Several contributors were identified to these causes including:               <ul style="list-style-type: none"> <li>○ Application and setting of Directional Comparison Blocking Schemes</li> <li>○ Failure rates of electro-mechanical relays</li> <li>○ Complexity, knowledge/skills gaps regarding micro-processor settings</li> <li>○ Impedance modeling, quality checks and lack of relay setting templates</li> </ul> </li> <li>• NATF has created and is reinforcing several relevant “superior practices” documents. See the Misoperations report for added details.</li> </ul>
Critical Infrastructure Protection (CIP)	<ul style="list-style-type: none"> <li>• Longstanding, active, and well-attended security practices group.</li> <li>• In October 2013 we added physical security work group.</li> <li>• Cyber/Physical are both standard parts of our peer review scope.</li> <li>• Project team efforts produced a comprehensive CIPV5 implementation guide.</li> <li>• Active member coordination is ongoing for CIP-014 implementation.</li> <li>• Joint NATF/EEI CIP-014 workshops October 30<sup>th</sup> and Nov 5<sup>th</sup>.</li> <li>• Significant increases planned regarding NATF security related assistance visits</li> <li>• NATF staff observed a CRPA. Similar NATF assistance are planned in 2015.</li> </ul>
Reliability Assurance Initiative (RAI)	<ul style="list-style-type: none"> <li>• Risk/Controls has been a topic of heavy focus for about last two years.</li> <li>• Risk/Controls were added as a standard peer review element in 2013.</li> <li>• R/C focus has evolved to a broader focus of Governance, Risk, and Controls.</li> <li>• NATF evaluating “endorsing” certain aspects of members GRC programs.</li> </ul>
Modeling	<ul style="list-style-type: none"> <li>• Two NATF Modeling practices were shared with NERC (January 2014) to preclude the need for NERC/Technical Committees to generate similar documents. These documents are:               <ul style="list-style-type: none"> <li>○ Generator specifications for planning, Ops, and real-time</li> <li>○ Power flow modeling reference document</li> </ul> </li> </ul>
Geomagnetic Disturbance (GMD)	<ul style="list-style-type: none"> <li>• NATF administered detailed member surveys to better gauge member understanding of GMD and actions towards mitigation. Generic results were shared with NERC GMDTF to help hone focus.</li> <li>• Conducted two GMD workshops (October 2013 and February 2014).</li> <li>• Ongoing, periodic coordination with the GMDTF to preclude duplication.</li> </ul>
Facilities Rating Alert follow-up activities	<ul style="list-style-type: none"> <li>• Working on superior practices for ongoing ROW maintenance. Update will be provided to NERC prior to 2014 YE.</li> </ul>

## **Attachment 2 - Other NATF Focus and Activities**

### **NATF / EPRI Collaborations**

- Conducted a comprehensive Resiliency Summit October 7-8
- Using a comprehensive, “all hazards” approach including
  - Severe Weather
  - Cyber / Physical Security
  - GMD/EMP/IEMI
  - Single point / common mode failures
  - Severe workforce reduction / pandemic
- Equipment Performance and Maintenance
  - Shared insights on failure rates, causes, and corrective actions
- Strategy Sessions: Grid Operations and Planning Synergies

### **NATF / INPO Collaborations**

- Shared Operating Experience / LOOP Reductions (IER 13-53)
- Nuclear plant switchyard self-assessment tools
- Emergency power runtime / fuel supply replenishment / Blackstart
- Joint switchyard (NATF/EPRI/INPO summit May 2015)

### **Other / General**

- Systematic Interaction with Members / ERO on Reliability Assurance Initiative (RAI)
  - Sharing of Key Principles and Lessons Learned
  - Strong Risk / Controls focus in Peer Reviews
  - Preparing Members for risk-focused audits
  - Interacting with ERO Staff (workshops, etc.)
- NATF 2014 Peer Review Program Fully Integrates:
  - Risk Assessment and Internal Controls
  - Human Performance Error Reduction
  - Operating Experience Exchange
  - Physical Security
- Other Recently Completed / Near Term Activities
  - Human Performance Symposium
  - System Operations – EMS focus
  - Vegetation management – detailed benchmarking / compliance template
  - Cold weather webinar
  - Using a comprehensive peer challenge board concept for selected member events

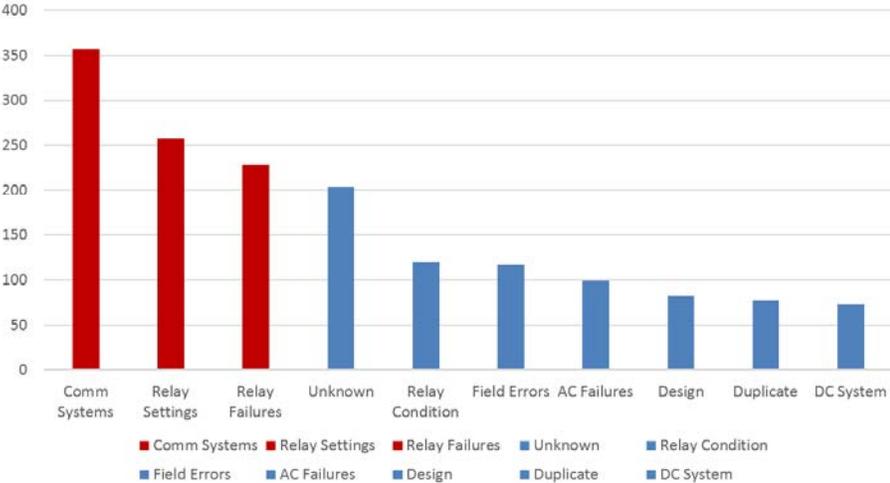
# Attach 3 / NATF Protection System Misoperation Reduction Project

NATF review of misoperation data member subset indicated three prevalent causes. NATF results were similar to previous work completed by the NERC Misoperations Task Force. The three prevalent causes were:

- 1. Relay Setting Errors,
- 2. Communications Channel Problems,
- 3. Relay failures.

Probing deeper into the data, NATF discerned more detail related to settings error causes.

## Misoperations (2008 – 2012) and Phase 2 Plans



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## NATF Project Team Observations

Industry personnel apparently lack sufficient understanding of certain principals and techniques required for setting and application of more complex protection relays and systems. As a result, NATF is generating superior practices and developing related training in the following areas:

1. The application and setting of Directional Comparison Blocking Schemes. This scheme was the largest contributor to misoperations.
2. Misoperation of electromechanical relays due to failure is still a major component of the total. Entities should have an aggressive program to update or repair these devices or replace them
3. Failures of microprocessor relays still causes misoperations even when these relays are monitored. Output contacts of these devices still need maintenance.
4. The new microprocessor relays are more complicated and the industry needs more training in the setting of these devices.
5. The industry still needs to follow existing best setting practices for impedance modeling, quality checks and relay setting templates.

The NATF recently developed superior practices for Relay Settings and Testing that addresses many of the issues involved in past misoperations. By re-enforcing these practices, misoperations will begin to be reduced.

## NATF Misoperation Reduction Activities

Five new working groups have been started to develop superior practices to address concerns identified by the project team. The sixth working group will deal with prevent relay failures that cause misoperations. This working group will start work in 2015. Working groups are as follows:

1. Powerline Carrier Application and Maintenance Practices
2. Short Circuit Impedance Modeling Practices
3. Relay Settings Training
4. DC Trip Circuit Design and Maintenance
5. Misoperations Data and Analysis
6. Relay Failures Issues

These working groups are working in the System Protection Practices Group and will be working on their assignments for completion in 2015. A working group on Relay failures will also be started in mid-2015 to address the concerns identified by the project team.

When the superior practices and processes are completed by the working groups, training will be provided to the NATF protection departments and peer reviews will monitor integration of these processes.

### **Protection System Performance Metrics**

Protection System performance metrics will be developed initially by the misoperations data working group. Once identified, processes will be implemented to monitor these metrics and benchmark them with other NATF members.