

Lesson Learned

Loss of EMS/Dispatch Workstation Functionality due to NTP Time Synchronization Device Misconfiguration

Primary Interest Groups

Transmission Operators (TOs)
Balancing Authorities (BAs)
Reliability Coordinators (RCs)

Note: This lesson learned applies to TOPs, BAs, and RCs that operate Energy Management System (EMS) and Supervisory Control and Data Acquisition (SCADA) systems and maintain a fully functional backup control center.

Problem Statement

An entity lost its EMS/Dispatch workstation functionality due to a time synchronization device misconfiguration at the time of integrating redundant backup servers to the EMS network.

Details

The EMS Support staff separated the redundant time source and three redundant servers from the Production EMS for testing purposes. The three redundant servers were simply separated from the production EMS by disconnecting their corresponding Local Area Network (LAN) cables. In addition, the time source was removed from the split servers. System operators worked in this configuration with no problems until testing was complete for the day. When testing was complete, the EMS Support staff reconnected the redundant servers back into the EMS Network without re-connection of the removed time source, causing an immediate unexpected failover to newly connected servers (i.e., the original backup server).

EMS Staff resolved the issue by reverting to original time-sync connectivity. Dispatch ran in this configuration for two hours and thirty one minutes until their workstations' Graphical User Interface (GUI) started to fail. At this time, the system operators had no BPS visibility and the EMS Support staff was called. The primary EMS Servers had the correct time and all other system functions, including AGC, SCADA, Interchange Scheduling, Data-link, and ICCP, were operating properly at the server level. Once on-site, the EMS Support staff confirmed that it was a time synchronization related issue on the dispatch workstations, re-pointed the time synchronization to the current primary time source on the EMS, and restarted the time synchronization process. The dispatchers were able to log on and regain BPS visibility once the EMS support staff corrected the time on their workstations.

Corrective Actions

Immediate corrective action

EMS support staff reconfigured the correct NTP source and resynchronized the EMS/Dispatch workstations.

Long-Term Corrective Actions

Begin to document the procedure for EMS server disconnect and reconnect to EMS network.
Start a study of the feasibility of networked NTP devices (Global Positioning System clock) connected to EMS network utilizing a routable protocol.

Lessons Learned

Time synchronization on all networked EMS/SCADA systems can be critical to the operation of the system, including user access to the system. Connecting and disconnecting EMS/SCADA servers from their networks and time sources can lead to erratic behavior and possible disruptions of availability. Procedures should be in place that define a prescribed power down and power up process that includes validation of time upon reconnecting to the EMS networks.

The redundancy, security, and consistency of time sources used by EMS/SCADA servers, workstations, and associated authentication infrastructure should be reviewed to ensure resiliency during unusual events or network reconfigurations.

NERC's goal with publishing lessons learned is to provide industry with technical and understandable information that assists them with maintaining the reliability of the bulk power system. NERC requests that you provide input on this lesson learned by taking the short survey provided in the link below.

Click here for: [Lesson Learned Comment Form](#)

For more information please contact:

[NERC – Lessons Learned](#) (via email)

[FRCC – Lessons Learned](#) (via email)

Source of Lesson Learned:

Florida Reliability Coordinating Council

Lesson Learned #:

20140902

Date Published:

September 16, 2014

Category:

Communications

This document is designed to convey lessons learned from NERC's various activities. It is not intended to establish new requirements under NERC's Reliability Standards or to modify the requirements in any existing Reliability Standards. Compliance will continue to be determined based on language in the NERC Reliability Standards as they may be amended from time to time. Implementation of this lesson learned is not a substitute for compliance with requirements in NERC's Reliability Standards.