

## Lesson Learned

### Redundant Network Interface Cards on EMS Systems

#### Primary Interest Groups

Reliability Coordinator (RC)

Transmission Operator (TOP)

Transmission Owner (TO)

#### Problem Statement

A network interruption occurred that caused the primary and backup energy management systems (EMS) to be unable to communicate with each other. As a result, both EMS systems attempted to become the “online” (primary) system, and this conflict caused both EMS systems to go offline.

#### Details

A temporary network interruption caused the communication link between the primary and backup EMS systems to fail. This was later traced to a faulty network interface card. Both the primary and backup systems attempted to become the “online” (primary) system, having assumed that the other system went offline since it was unreachable. Each system then sent the other a signal to become the backup system, and when the communication link between the systems was restored, both systems went offline from these signals.

#### Corrective Actions

Redundant network interface cards were introduced on the primary and backup EMS systems.

#### Lessons Learned

Redundant network interface cards on the primary and backup EMS systems may have prevented this incident. Equipment failure would likely affect only one network interface card at a given time, rather than both at the same time. If this had been the case, the primary and backup EMS systems would still have communication with each other, and the signals to go offline would not have been sent.

The NERC Energy Management System Working Group (EMSWG) recommends periodic validation of network, server and control room console communications redundancy and teaming operations.

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Source of Lesson Learned:	Northeast Power Coordinating Council
Lesson Learned #:	20140901
Date Published:	September 16, 2014
Category:	Communications

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