NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Lesson Learned

Control Network Communication Path

Primary Interest Groups
Reliability Coordinators (RCs)
Balancing Authorities (BAs)
Transmission Operators (TOPs)

Problem Statement
Following a failover exercise being conducted pursuant to EOP-008-1, the TOP's router bandwidth for network traffic between control centers saturated and led to a flat-line condition, preventing communication between the active control center (ACC) and the active data center (ADC). The ADC serves the ACC's monitoring and controlling capability by housing the active supervisory control and data acquisition (SCADA) servers and associated equipment. As a result of the bandwidth saturation, the ACC lost the ability to monitor and control its portion of the Bulk Electric System for approximately 39 minutes.

Details
The entity scheduled a functional test of its backup data center (BDC), which included transferring SCADA functionality from the primary data center (PDC) at its primary control center (PCC) to the BDC at its backup control center (BCC). When SCADA functionality was transferred, the TOP's system operators performed monitoring and control remotely from its PCC utilizing the BDC as the ADC.

Following the failover exercise, SCADA support personnel began working on scheduled maintenance tasks, including completion of an in-progress change on a BDC server. Change testing and subject matter expert (SME) experience did not indicate this task would have any effect on reliable operations. The same change had been previously applied to an identical server without incident when the PCC and PDC were both active.

During execution of the change, the TOP's system operator reported its SCADA heartbeat had flat-lined. SCADA support stopped all on-going work and began investigating the cause of the communication loss.

Corrective Actions
SCADA administrators failed back over to the PDC to resolve the issue.

Going forward, the entity is instituting technical controls to prioritize SCADA communication network traffic over other network traffic on the out-of-band router to reduce the likelihood that bandwidth saturation will interrupt SCADA communication.

Lessons Learned

Entities running workstations that are remote from EMS/SCADA servers should prioritize network traffic such that situational awareness traffic is prioritized over other network traffic, such as cybersecurity logging traffic. Technical controls can be established with quality of service configuration on network devices which allows prioritization of situational awareness traffic and traffic levels.

Additionally, entities should consider if there should be a prohibition on nonemergency changes when operating remotely from EMS/SCADA servers.

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.

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Source of Lesson Learned:	Texas Reliability Entity
Lesson Learned #:	20151202
Date Published:	December 29, 2015
Category:	Communications

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