

## Lesson Learned

### Unavailability of the Transmission Stability Limits Calculation Application

#### Primary Interest Groups

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

#### Problem Statement

The transmission stability limits calculation (TSLC) application became unavailable twice during a five-hour period. The first interruption was for a period of two hours and the second for 30 minutes. During the time that the application was unavailable, the transmission stability limits were not updated, but thermal real-time limits and post contingency limits were still available during that time.

#### Details

A planned firmware update to the firewall caused a communication interruption of an archiving function related to the TSLC application. When the system operator (SO) was alerted of the situation, the SO was able to use the last limits updated by the TSLC application prior to its unavailability. These limits were still accurate during the unavailability of the TSLC application since there were no configuration changes on the power system during this period. However, if there were scheduled configuration changes on the bulk power system, the SOs at the system control center (SCC) would apply an operating instruction that would allow them to stop any work on the system and, if needed, the engineering support team will use the TSLC application tables manually to provide the limits to the SO at the SCC.

Upon acknowledging the communication interruption of the archiving function, service was transferred to the secondary server to restart the primary server in an attempt to reset the archiving function. Even though the primary server restart caused a hardware failure, the TSLC application service remained available on the secondary server.

With the secondary server still available, the SO was alerted that the stability limits were not updated. The limits provided by the TSLC application were sent to the energy management system (EMS) through a utility server, but the utility server was not able to maintain the communication link for longer than two hours after the interruption of the primary server. The inability to maintain this communication link caused the interruption of service and the related alerts. Upon completion of the diagnostic, the required actions to restore the service were identified and the TSLC application was restored on the secondary server.

When the second application interruption occurred, the SO was alerted that the stability limits were not updated. However, the TSLC application was restored on the secondary server by performing the same actions that were performed for the first interruption, thereby restoring the primary server of the TSLC application.

The first finding of the investigation was that the utility server was unable to maintain its communication due to a queuing process overflow in the EMS application.

A second finding showed that the archiving function interruption was caused by the use of a sharing protocol that proved sensitive to communication interruptions.

### **Corrective Actions**

The EMS application update introduced a fix for its queuing overflow problem by clearing the queue upon the process start-up. After testing the software update, the EMS application was deployed in the production environment.

A plan is in progress to replace a sharing protocol with a more reliable method of transferring data. The sharing protocol needs to be replaced by a less sensitive protocol as there is no possible mitigation of the communication interruption during this required firewall update in its present configuration.

### **Lesson Learned**

Diagnostic information provided by the monitoring functions must provide sufficient information to minimize the time to pinpoint the cause of the service interruptions when alert conditions are displayed. Supplemental functions that are critical to operations must be designed to provide sufficient diagnostic information.

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