

# Lesson Learned

## EMS Database Corruption Problem

### Primary Interest Group

Balancing Authorities (BA)      Transmission Operators (TOP)  
Reliability Coordinators (RC)      Transmission Owners (TO)

### Problem Statement

An entity's Energy Management System (EMS) ceased operating due to the EMS vendor's "delete" software. This software is used to clear configuration database directories before an update is made to the database. In this particular instance, the software did not completely work causing the revised configuration database to contain mismatched and corrupted data. There was no loss of situational awareness during the event because operators implemented procedures that were developed to handle times when the EMS was not available. These procedures included, for monitoring and control purposes, physically manning the hydro plants and major substations.

### Details

An entity's EMS staff deployed a revised EMS configuration database within the EMS production systems. It was deployed in order to configure Supervisory and Control Data Acquisition (SCADA) and Automatic Generation Control (AGC) applications to accommodate generator upgrade commission testing. While deploying the above database change, the redundant EMS application servers failed to accept the revised configuration database causing the EMS to quit functioning.

The entity's EMS workgroup procedure included a step to delete previous configuration files from the database build directory. This "Delete" operation is now known to not always completely erase the directory. Analysis by the EMS vendor determined that the new database was built with some previous database files present in the database build directory which corrupted the configuration database. In order to identify the source of the corrupted files in the database build directory, the entity and vendor reviewed the procedure used to build and update the configuration database. It was during this review that the vendor's technical support staff stated that the "Delete" operation to remove previous database files has been unreliable at times in other systems. Until this incident, this command has worked reliably for the entity's EMS.

To maintain situational awareness and control when the EMS quit functioning, operations placed personnel in unmanned generation plants and critical substations. They also utilized a back-up AGC load controller that is completely separate from the EMS system. The controller calculates Area Control Error (ACE) from separate inputs from EMS and allows for pulse control of the generators. The entity was also able to manually participate in their reserve sharing agreements.

### Corrective Actions

Once the problem was discovered, EMS staff ensured the delete step worked and rebuilt the database. These actions allowed the EMS to return to normal service. The entity's EMS workgroup procedure to build new configuration databases was reviewed and changed to include a step to confirm that previous

configuration data files have been deleted. EMS staff checklist for configuration database deployment was modified to include the verification step that all previous database files have been deleted.

### Lesson Learned

Entities should check with their EMS vendor to make sure they have not experienced any problems with current vendor software to change data bases. EMS staff should review its EMS workgroup process and software to ensure configuration databases are built without the presence of previous data files. The EMS staff checklist for configuration database deployment should include the verification step that all previous database files have been deleted.

Software vendors and their user groups should inform all users, as soon as possible, about any problems that have been found even if the problem has a random occurrence. This notification allows all users to put in place safeguard procedures to ensure such problems do not affect their systems.

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