

# Lesson Learned

## Loss of ICCP due to Database Sizing Issue

### Primary Interest Groups

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

### Problem Statement

During a network model update, a problem was caused by a combination of the number of points being requested by the state estimator (STE) and the number of points available in ICCP. This problem initiated a failure of ICCP, which resulted in the inability to obtain reliable results from the STE and contingency analysis applications.

### Details

A large transmission owner in the Eastern Interconnection is in the process of updating and expanding its STE network model. As part of this long-term project, a significant amount of additional data is being requested from neighboring utilities. As such, a tremendous number of points are being added to the ICCP databases to support the expanded model. The entity's ICCP server is configured to talk to external companies as well as six internal servers. With each link into the ICCP server, an associated database table, called ENTRY, on the ICCP server is dynamically allocated based on the number of points being exchanged.

As part of the model expansion project, additional links were implemented to assist with the development of STE server staging for testing. The number of items in the ENTRY table expands by the following calculation: *(the number of new points) X (the number of links receiving the new points)*.

This STE update required an additional 13,000 points from the ICCP. These had already been added to the ICCP database and to the development and staging STE servers. When the production STE server was updated, it began requesting the 13,000 additional points again and the ENTRY table was increased by 26,000 points (13,000 for each of the two production STE servers). This exceeded the maximum allowed size of the ENTRY table and caused the ICCP processes to abort. Further investigation revealed that the ENTRY table was 97% full prior to the expansion, and the extra points caused it to exceed its maximum size.

A failback to the previous ICCP database was attempted, but this did not successfully resolve the issue.

There are multiple ways the issue could have been resolved:

- The ICCP database could have been decreased in size below the threshold.
- The number of points being requested by the STE server could have been reduced.
- The number of links exchanging data with the ICCP server could have been decreased.
- The requests being made could have been accommodated by increasing the size of the ENTRY table.

## Corrective Actions

- The database table was temporarily resized to accommodate the appropriate number of entries.
- More extensive research was done to determine the total size that will be needed through the end of the network model expansion project.
- A report was created to compare the current size of database tables to their maximum limit. This is now reviewed at each ICCP database change.
- Two ICCP support staff completed a vendor class on ICCP support and maintenance.

## Lesson Learned

- Database sizes need to be carefully monitored as a system is expanded. Sizes should be large enough to accommodate all data being requested, not just what is currently being transferred.
- Primary databases, as well as peripherally associated databases, need to be evaluated for size constraints.
- ICCP databases should be set up so that external companies cannot inadvertently request data that does not originate in the host utility.
- Backup support staff should be fully trained so that discovery of problems does not rest completely with primary support personnel.
- The vendor may need to be contacted to verify that database sizes can be increased without causing problems or to provide a more comprehensive validation routine.
- Support staff should meet regularly to discuss questions, discoveries, and findings.
- Alternative ICCP configurations need to be evaluated to determine if there is a more efficient means to feed data into the staging and development systems.

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