

## Case Study: TVA SEQUOYAH MCS-8 UPGRADE

### Site Location:

- TVA Sequoyah Chillers
- Six (6) installed in Safety Area's

### Concerns:

- Number of Failures
- Inability to Rotate Chillers
- Startup problems when starting backup Chiller

### Equipment:

- Four (4) Dunham-Bush Condensing Units
- Two (2) Dunham-Bush DX Chillers
- All units had standard TX Expansion Valves
- All Units had standard Mechanical Controls



TVA Chiller with MCS Controls

### Steps Taken:

- Upgrade Controls to MCS-8 Microprocessor
- MCS-8 had over ten (10) years in Field
- MCS-8 had proven Track Record in Chiller Controls.
- MCS-8 Utilized worldwide
- Testing
  - MCS-8 was Seismographic tested
  - MCS-8 Software was validated
  - MCS-8 was EMI/EMC tested
  - Passed all test with no changes



### Results:

This upgrade was completed in 2003—2004. For the three (3) years prior to the MCS-8 microprocessor upgrade there were a total of 35 failures. For the three (3) years after the installation of the MCS-8's there were only 20 failures. A reduction of 42 %. There were twelve (12) control related failures during the three (3) years prior to the MCS-8 installations. There were zero (0) control related failures in the three (3) years after the upgrade.

During the startup, after the upgrade, the micro showed that the Hot Gas Bypass solenoid required adjustment. It was open too much and causing the machine to load & unload. By using the MCS-8 while adjusting it was possible to pinpoint the adjustment and hold the Target Temperature to  $\pm 0.5$  degrees F.

**REDUCED FAILURES BY 42% !**

**ELIMINATED ALL CONTROL FAILURES !**