

Tarrant Regional Water District Satisfies Growing Production Demands Using Advanced Reliability



RESULTS

- Factory acceptance testing accuracy increased 100%
- Additional staff requirements for future pumping stations reduced 50%
- Emergency maintenance cost reduced 20%
- Unplanned critical mechanical failures minimized



APPLICATION

Water storage, pumping, and distribution

CUSTOMER

Tarrant Regional Water District.

Tarrant serves over two million people in Fort Worth, Texas and outlying communities by supplying water to area treatment plants. It owns and operates six pumping stations in a 150 square mile area.

CHALLENGE

To satisfy the growing water demand in the Fort Worth area, the water supply system output has increased from 50% to 80% of capacity. This has removed system redundancy and backups so that total equipment reliability is now essential to meet customer demands. Occasional unexpected equipment failures are no longer an option.

Tarrant Regional Water District had for years monitored the health of its pumping equipment with a route-based vibration system. A technician would travel to each remote pumping station on a monthly basis. If a unit was not operating during the technician's visit, no data was collected. This style of monitoring proved inadequate for real-time health reporting, early problem detection, and optimum corrective action scheduling.

With no additional budget or staff, Tarrant was challenged to:

- Assure asset reliability to satisfy growing customer demands
- Lower emergency maintenance costs
- Improve effectiveness of maintenance operations
- Minimize cost of spares
- Optimize the performance of fixed assets

"Our pumping stations are unmanned, so we missed a lot of vibration problems in the past."

"I have peace of mind going to bed at night, and not worrying about something going on. I know we're going to catch everything possible."

Boyd Miller
SCADA Operations Manager

SOLUTION

An existing Supervisory Control and Data Acquisition (SCADA) system controls and monitors the entire water system. Tarrant's SCADA Operations Manager, Boyd Miller, believed that vibration monitoring would be more effective and performed more efficiently if integrated into the SCADA, so Tarrant partnered with Emerson to implement a centralized online vibration monitoring system for capital-intensive equipment. Emerson engineers provided a customized solution using Emerson's CSI 4500 Machinery Health™ Monitor with advanced network fault tolerance to assure continuous data integrity. If the network fails, machinery condition data is automatically stored on local servers and then updated to the central server when the network is restored. All vibration data as well as oil predictive data is integrated and managed using Emerson's AMS™ Suite: Machinery Health Manager application, which powers the PlantWeb architecture with predictive and proactive maintenance through condition monitoring of mechanical equipment to improve availability and performance. For early problem identification, Emerson's Analysis Services Team remotely provides detailed monthly analysis and trending of the vibration data.

The online monitoring system provides SCADA system operators with real time vibration alarms and status. Vibration is now used as a process variable along with pressure and flow to determine optimum pump efficiency. The online system provides efficiency gains so that manpower is now available to perform predictive monitoring on other critical equipment such as exhaust fans.

Using the online system, equipment is monitored during factory acceptance testing. Pump and motor defects have been detected on four different occasions. This eliminated future failures and having to deal with equipment failures after the warranty period has expired.

"Factory acceptance tests have caught 4 failures so far. We shipped them back to the OEM for replacement."

"There's no way we would ever build a new station without a CSI 4500 system."

Boyd Miller
SCADA Operations Manager

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Online Machinery Health Management powers PlantWeb through condition monitoring of mechanical equipment to improve availability and performance.

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