

PROJECT PROFILE



John Day Dam and Navigation Lock Monitoring System Rufus, Oregon

Client:

*U.S. Army Corps of Engineers,
Portland District*

Located 216 miles upstream from the mouth of the Columbia River, the John Day Dam crosses the river near Rufus, Oregon. The Power Generation structure has an output capacity of 2,160,000 kw and the Navigation Lock structure is over 675 feet long and 86 feet wide, with a maximum lift capability of 113 feet. The powerhouse, navigation lock and the spillway combine to create a structure over 1 mile wide and is a key component of the Columbia River Hydro Power and Navigation Projects.

The Portland District of the U.S. Army Corps of Engineers (USACE) is currently evaluating a number of different long-term performance and maintenance issues at the project. USACE determined that an automated monitoring system for use in

collecting and evaluating data for the large number of instruments currently being monitored would be beneficial for the project. A range of methods were used to collect data from the existing instruments including stand alone dataloggers and manual readings.

In addition, a large number of new instruments were being installed to collect data for the design of repairs to the lock structure. The repair work included installing high capacity rock anchors to reduce structural movements in key monoliths during the emptying and filling cycles. Data collected from the new instruments will also be used to evaluate the effectiveness of the repairs.



Engineered Monitoring Solutions completed the design of an integrated monitoring system that satisfied the needs of the 3 different user groups for the project: dam safety, design engineering for the repairs, and operations personnel.

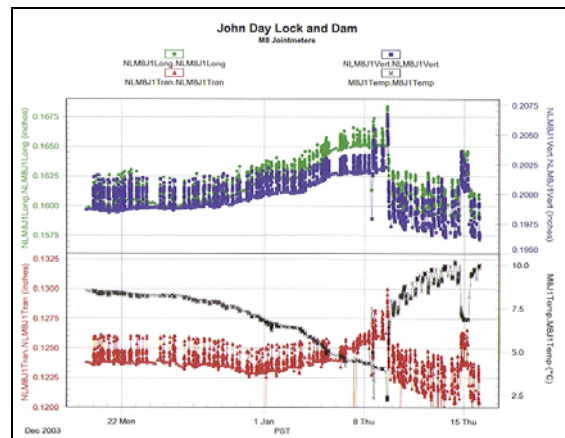
A wide range of measurements are made on the project, including piezometer pressures, drainhole pressures, drainhole flow rates, weir flows, joint movements, and monolith tilt measurements.



A network of Measurement and Control Units (MCUs) coordinate data collection from the large number of monitoring points. Data is communicated to a gateway MCU by radio. Data is automatically downloaded from the project to the Portland District's office in Portland, Oregon via a dial-up modem connection, allowing dam safety and engineering personnel to remotely review and evaluate the data.



A data management tool was also configured for the project and was integrated with the data collection system to provide data presentation in a convenient, simple-to-use format. Future plans for the system include providing alarm notification to on-site operations personnel in the event an alarm threshold is exceeded. This will be accomplished through an interface with the existing SCADA system for a number of critical monitoring stations.



The system provides monitoring across the entire project, including the right abutment earth embankment, navigation lock structure, and the spillway and powerhouse structures. The system will be implemented in phases. Implementation of the first phase was completed by Engineered Monitoring Solutions. The first phase consisted of a system for monitoring the navigation lock structure including the repair work. Additional phases will be completed in the future, resulting in a single, comprehensive and integrated monitoring system for the project.