



### Marmet Navigation Lock Construction Monitoring System Charleston, West Virginia

**Owner:**

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

The U.S. Army Corps of Engineers – Huntington District awarded a contract for the construction of a new navigation lock at the Marmet Locks and Dam Project. The existing twin locks and dam are located on the Kanawha River near Charleston, West Virginia. These existing locks, measuring 360 feet long by 56 feet wide, were opened in 1933 and are the busiest locks on the Ohio River System. To improve the volume of barge traffic through the locks, a new lock chamber, measuring 800 feet long by 110 feet wide, is being built adjacent to one of the two existing locks and is scheduled for

opening in 2008.

Since barge traffic needs to continue through the existing locks during construction of the new lock, an extensive instrumentation system was installed to monitor the adjacent lock wall and newly constructed coffer dam.

The instrumentation system includes approximately 80 in-place inclinometer sensors, 60 load cells, 70 piezometers and 20 tiltmeters. An automatic data acquisition system (ADAS), consisting of 30 radio linked measurement and control units (MCUs) was installed to monitor these instruments.

The MCUs are programmed to convert raw sensor measurements into the appropriate engineering units and to compare these values to a threshold level. In the event that a threshold value is exceeded, the MCUs trigger visual and audible alarms at several locations around the construction area.



## Marmet Navigation Lock Construction Monitoring System (continued)



The ADAS was experiencing some unusual problems that included frequent gaps in logged measurement data and false instrument alarms that could not be explained. Engineered Monitoring Solutions (EMS) was called on to investigate these problems. After extensive testing, we concluded that the best approach to addressing these problems was to modify the ADAS programming. So EMS undertook a major reprogramming effort for all 30 MCUs. As a result, the data gaps and false alarms were virtually eliminated and the ADAS is performing satisfactorily.