

Real-time Infrastructure Monitoring Solutions for US Army Corps of Engineers, New Orleans District

Balaji Ramachandran, Associate Professor of Geomatics, Department of Applied Sciences, Nicholls State University.

Kent Hebert, Lead Civil Engineering Technician, US Army Corps of Engineers, New Orleans District.

The US Army Corps of Engineers (USACE), New Orleans District, located on the banks of the Mississippi River in Southern Louisiana, manages and maintains a vast number of navigation and flood control structures. They are all located in an environment prone to subsidence, unstable soil composition, and extreme groundwater fluctuations. The New Orleans District has long sought a solution to monitor shifts in these navigation and flood control structures caused by changes in the environmental conditions such as a flood, storm surge, and shifting groundwater levels, as well as man-made impacts such as merchant vessel collisions and impacts from local development. The recent un-watering of the Inner Harbor Navigation Canal Lock (IHNCL) for regular maintenance offered an unique opportunity to test a new infrastructure monitoring system, centered around Trimble Navigation's suite composed of Autonomous Servo-Driven Total Stations, Pivot Platform, and 4D Infrastructure Control Software. This network centered-solution approach allowed for the first time a real-time, fully autonomous data collection and processing platform, completely independent of the structure in question, monitoring minute structural motion and providing access to the data 24 hours a day, 7 days a week, with no delay due to manual monitoring and displacement computation requirements. The approach has reduced the project costs and man-hours for the District. Further, safety of personnel has improved by several orders of magnitude from their existing monitoring approach. USACE, New Orleans District plans to implement this novel real-time monitoring solution as a standard monitoring method for all of their structures.