FOCUS 35 Total Station Monitors Dam Movement

At the Razisse dam on the Dadou River in southwest France, a Spectra Precision FOCUS 35 robotic total station has just completed monitoring the structural movements that occurred during recent major repairs and improvements to the dam. The FOCUS 35, with its one arc-second accuracy, was chosen to monitor to a half-millimetre accuracy movement of the arch dam abutments during a particularly critical six-week period in the construction project.

The Razisse is an arch and gravity type dam 30 metres high and 300 metres across, built in 1955 to impound water for hydroelectricity. The current engineering project to improve dam performance and ensure downstream safety included raising the dam height by 60cm, reinforcing existing abutments and adding two new piano key spillways.

Settling Monitoring for XY Movement

Raising the height of the dam was expected to cause the abutments to settle. To ensure that the abutments were settling properly and within expectations, the FOCUS 35 was positioned to measure XY movement. Eight survey points were selected. Four prisms were placed on the existing parapet of the right abutment and four prisms on the reaction points of the left abutment. The survey points were measured and recorded at different steps in the project: before deconstruction, after deconstruction and before and after post-tensioning tendons. To ensure accuracy each prism was measured four times and averaged to produce a final result. Measurements were taken at each step, then five days and 10 days following each step.

The results of the measurements were communicated in real time to the contractor through an Excel file comparing the measured movement to the theoretical movement. The results enabled engineers to make critical go/no go decisions on whether to move further into the project. The final movement was less than a tenth of a millimetre, well within the expected acceptable value.