

Bazergues - Emergency Dam Monitoring

CLIENT: SITES/VILLE DE COMMENTRY

How a rapid response monitoring solution helped protect infrastructure and local people

Challenge

The Bazergues reservoir in the Auvergne-Rhone-Alpes region of France was built in 1953 to supply the city of Commentry. A concrete dam measuring 156m in width and 19.7m in height was built across the River Banne. Inspections identified structural deformation, causing concern about its condition and raising the urgent need for more information. The cause of movement was unclear, but possible factors included:

- **Age-related deterioration:** most French dams were designed with a 100-year lifespan, but require maintenance.
- **Recent refurbishment works,** including abutment anchoring and construction of a new spillway.
- **Recent European heat wave,** with record high temperatures above 40°C (104°F).

The identified movement placed the dam dangerously close to the limits of its ongoing monitoring which used hanging/inverted pendulum methods.

An early warning solution had to be rapidly deployed to guarantee the safety of those in the valley below.

Solution

Survey and monitoring specialist Sites contacted Senceive requesting the urgent delivery of an 18m continuous tilt beam chain. Senceive offered a full turnkey solution including its following core products:

FlatMesh™ Nano & Tilt Sensors

These small, lightweight sensors proved easy to handle for the rope access technicians. The sensors can provide up to five years battery life and allow a reporting rate down to seconds. The tri-axial tilt sensors were installed quickly without the need for bespoke levelling brackets.

Beam Kit 2000mm

The combination of Senceive in-house design and high-end UK manufacturing provided a lightweight bracket with no temperature deformation.

FlatMesh™ 3 Cellular Gateway

The FlatMesh™ gateway allowed the immediate and automatic connection of all sensors on site without any configuration. Data were transferred continuously via the local cellular communications network.



Outcome

Within five days of their query, the Sites team had received its equipment for an immediate installation on site. The small enclosures and bespoke beam brackets enabled easy installation of the system within just three hours by a three-person team.

Dam rotation was monitored at a resolution of 0.0018mm/m at a 30 minute reporting rate without the risk of the sensors dropping out of range. All data were continuously sent to Sites visualisation platform Simon-e®.

Senceive offered a cost-effective and precise solution, without the need for further site intervention in this remote part of France.

Key Points:

- **Ageing dam showed potentially dangerous levels of movement**
- **Rapid mobilisation and installation of monitoring (five days from enquiry to commissioning)**
- **Monitoring programme provided insight and assurance to stakeholders**