



### Baish Dam, Kingdom of Saudi Arabia



#### PROJECT SUMMARY

Project Summary

NAME: Baish Dam

YEAR: 2016

CLIENT: Ministry of Water and Electricity

INSTRUMENTATION: Triad Technical Services

CONSULTANT: Geosense



#### OVERVIEW

The Baish Dam is a gravity dam on Wadi Baish about 35km northeast of Baish in the Jizan Region of south-western Saudi Arabia.

The dam has many purposes including flood control, irrigation and groundwater recharge. The total reservoir capacity of the dam is 192 million m<sup>3</sup>.

The dam was constructed between 2003 and 2009 and at 106m high on completion, it was the tallest dam in Saudi Arabia. It is owned and operated by the Ministry of Water and Electricity.

Baish dam is one of six dams currently undergoing the change from a manual to a fully-automated monitoring system.

The original instrumentation equipment was installed during construction and was entirely manually-read. The Ministry made the decision to upgrade the instrumentation to a modern automatic system including full data logging of all instruments together with alarm trigger levels and data access via the Internet.

#### MONITORING

After consultation with Ministry Engineers, Geosense designed a system installing new instruments side by side with the existing instrumentation and upgrading several areas to provide a fully integrated and automatic dam safety monitoring system.

All the new instruments were connected into a data logging system and provide real-time visualisation within the dam control room.

The dam integrity is carried out by monitoring key areas as follows:  
Main dam body Inclination  
Galleries Expansion joints Seepage  
upstream pore water pressures  
Downstream pore water pressures  
Dam main drain Seepage  
Dam reservoir Water level  
Dam abutments Settlement  
Seismic monitoring

#### PRODUCTS USED

##### VW piezometers

Measurement of pore water pressure.

##### AXMi 3D Inclinometers

Combined Magnetic Extensometer & In-Place Inclinator for both settlement and inclination profiles.

##### Pendulums & Telependulums

Measures inclination and horizontal displacement.

##### VW Triaxial Crack Gauges

Measures expansion or contraction in the dam joints.

##### V-notch Weir & Monitor

Measurement of seepage flows.

##### Remote Multiplexers

Allows multiple sensor cables to be connected into one central location.

##### GeoLogger GL1000

Multi-channel data logger for remote reading and logging all instruments.

##### Accelerometers & Recorders

Measures seismic activity for early damage detection.