Tishreen Dam, Syria

PROJECT SUMMARY

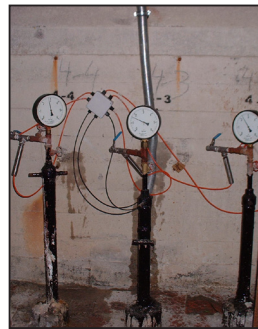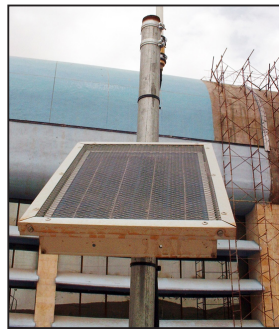NAME: Tishreen Dam Automatic Instrumentation

YEAR: 2006

CLIENT: General Organisation of The Euphrates Dam

MAIN CONTRACTOR: N/A

INSTRUMENTATION: GEOSENSE

CONSULTANT: Geosense

OVERVIEW

Completed in 1991 and situated within the Tigris-Euphrates basin, the 630MW hydro-electric Tishreen Dam has a storage capacity of 1.9 km3 and generates 1.6 billion kWh of electricity every year.

The original instrumentation equipment was installed during construction and was entirely manually read.

Due to a serious dam failure in Syria the General Organisation for Euphrates Dam (GOED) decided to upgrade the instrumentation to a modern automatic system including full data logging of all instruments together with alarm trigger levels.

After consultation with the GOED Engineers, Geosense designed a system installing new instruments side by side with the existing 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 provided real time visualisation within the dam control room.

MONITORING

The dam integrity is carried out by monitoring key areas as follows:

Main dam body
Pore water pressures

Dam main drain
Seepage

Dam abutments
Groundwater levels

Power house
Expansion joints
Relief well seepage
Upstream pore water pressures
Downstream pore water pressures
Temperature

Bridge deck Expansion joints
Temperature

Galleries
Seepage
Upstream pore water pressures
Downstream pore water pressures

PRODUCTS USED

VW piezometers
Measurement of pore water pressure.

Borehole packers
Produce a response zone in a borehole in combination with a piezometer.

VW triaxial crack gauges
Measures expansion or contraction in the dam joints.

V-notch weirs
Measurement of seepage flows.

Terminal switch boxes
For the connection and reading of up to 34 Instruments.

Data loggers
Multi-channel remote reading and logging with solar panel and back-up battery.

Telemetry system
Radio based system to connect the main processing computer with the remote data loggers.

GeoViewer
Data visualisation software.