Completed in 1991 and situated within the Tigris-Euphrates basin, the 630MW hydro-electric Tishreen Dam has a storage capacity of 1.9 km$^3$ and generates 1.6 billion kWh of electricity every year.

The dam is constructed with a chalk impervious core and seepage beneath it controlled by a Bentonite/cement cut-off wall. The complex comprises the main dam, a powerhouse constructed as a gravity dam and a small fuse plug.

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 new 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 provided real time visualisation within the dam control room.

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
- **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 which retrieves data from the data logger in near real time and processes the information in either map, profile or graph formats. Trigger levels & alarms can also be set.