Planning a performance monitoring program is an essential component of successful dam construction and operation. Dam monitoring is recommended to ensure the safety of a dam and to control its trend.

AIMS OF INSTRUMENTATION
- Evaluate the initial conditions at dam site
- Safety during construction stages
- Safety during initial filling and drawdown, including basin
- Long-term monitoring of dam structure
- Monitor the performances during dam life

MAIN DAM TYPES
- Concrete gravity dams
- Concrete arch dams
- Embankment clay-core dams
- Embankment rock-fill dams
- RCC dams

EXAMPLE OF EMBANKMENT DAMS MONITORING SYSTEMS
Clay core dam
Rock-fill dam
EXAMPLE OF CONCRETE DAMS MONITORING SYSTEMS

Arch dam

Gravity dam

INSTRUMENTS

- Direct and inverted pendulums
- Concrete embedded strain-gauges
- Embedded thermometers or thermistor strings
- 3D Rosette strain gauges
- Weirs (flow meters)
- Tiltmeters
- Jointmeters
- Piezometers
- Geodetic survey points
- Strong motion accelerographs
- MPEX extensometers
- Submersible tiltmeters
- Relative pressure transducers
- Earth pressure cells
- Embedment jointmeters
- LLS Liquid Level Gauges
- Casagrande Piezometers
- Inclino-settlement columns
- Embankment extensometers

PURPOSES

- Monitoring dam horizontal displacements
- Monitoring strains within concrete mass
- Evaluation of thermal curve during concrete mass curing
- 3-D monitoring of strains within concrete mass
- Evaluation of water seepages
- Local inclinations (horizontal displacement) of the structure
- Surface monitoring of existing cracks or structural joints
- Monitoring of pore water pressure
- Topographic control of structural displacements
- Structural responses after seismic event
- Monitoring of settlements and displacements at different depths
- Local inclinations of the structure also in underwater conditions
- Monitoring of water table level in standpipes and in the basin
- Total pressure between dam body and foundations or within the embankment
- Monitoring of structural joints within concrete structures
- Settlement monitoring within the embankment
- Pore water pressure
- Monitoring of horizontal and vertical embankment displacements
- Monitoring of horizontal displacements within the embankment
OMNIALOG DATA ACQUISITION SYSTEM

OMNIALOG data acquisition system is designed to be versatile and flexible. By adding modular components, the system can be configured to handle the simplest or the most complex projects. A single logger, housed in a cabinet with multiplexer expansion boards and a communications interface, can manage a large number of sensors. OMNIALOG is easily adapted for different applications by using external multiplexer boxes. Such distributed systems can be connected in a daisy chain or in star configuration to the master unit. Recorded data can be downloaded to a USB memory stick or pushed to remote FTP servers. Alerts can be sent by SMS or email, and graphs and reports can be generated on web pages for their access anywhere.

WEB MONITORING SYSTEM

WMS is a software platform designed and developed by our sister Company “Field Srl” to validate, process, convert, manage, and automatically display data and graphs from geotechnical, structural, dynamic, meteorological and environmental monitoring systems. OMNIALOG datalogger, equipped with any communication interface, send data to a remote server that validate them, removing spikes and anomalous readings, and processes the readings converting them into engineering units in order to add them to its SQL database. The readings are then available in the form of charts or tables through the “Galemys” application. The entire process is automated so that current data are available 24 hours a day, 7 days a week. If a reading value exceeds a preset alarm threshold, WMS can send an alarm notification via SMS or an e-mail to the mobile phones of registered users.

DISCOVER OUR INSTRUMENTS

- DIRECT AND INVERTED PENDULUMS
- TELEPENDULUM TEL-310
- CONCRETE EMBEDDED STRAIN-GAUGES
- THERMOMETERS
- CONCRETE EMBEDMENT JOINTMETERS
- JOINTMETERS AND CRACKMETERS
- TILT METERS (CLINOMETERS)
- VEIRS (FLOW METERS)
- SUBMERSIBLE TILT METERS
- RELATIVE PRESSURE TRANSDUCERS
- VIBRATING WIRE PIEZOMETERS
- MEXID MINIATURIZED MPBX EXTENSOMETERS
- EARTH (TOTAL) PRESSURE CELLS
- LIQUID LEVEL SYSTEM
- EMBANKMENT EXTENSOMETERS
- CASAGRANDE PIEZOMETERS
- WATER LEVEL METERS
- INCLINO-SETTLEMENT COLUMNS
- B.R.A.IN MEMS INCLINOMETER SYSTEM
- BH-PROFILE IN PLACE INCLINOMETERS
- MAGNETIC DETECTOR PROBES
- OEX-S 3-D EXTENSO-INCLINOMETERS
- OMNIA DATALOGGERS
LAST REFERENCE
PROJECTS

Vedi Dam, Armenia
Songloulou Dam, Cameroun
Asopos Dam, Greece
Wala Dam, Jordan
3rd LNG Tank Revithoussa island, Greece
Dabar HPP, Serbia
Casanuova Dam, Italy
Kokkinolakkas Dam Chalkidiki mines, Greece
Cerro del Agua hydroelectric project, Perù
Ituango Hydroelectric Project, Colombia
Asterios Dam, Greece
Cahora Bassa HPP, Mozambique
Nam Ngiep 1 Hydropower Project, Laos
Darn in Ikaria Island, Greece
Azad Dam, Iran
Karatzas Dam Chalkidiki Mines, Greece
Rogun Dam, Tajikistan
Riachuelo plant Lot 1/3, Argentina
Neckartal Dam and Bulk Water, Namibia
Metsovítiko Dam, Greece
Diga Ouldjet Mellegue, Algeria
Metolong Dam, Lesotho

Racibórz hydropower project, Poland
No hob Dam, Iran
Shahri Koor Dam, Iran
Diga Castel Giubileo Roma, Italy
Darkas Dam, Greece
Polrood Dam, Iran
INGA hydroelectric project, Congo
Beni Slimane Dam, Algeria
Kufranja Dam, Jordan
Qanouna Dam, Saudi Arabia
El Quinbó project, Colombia
Draa Diss Dam, Algeria
Kerrada Dam, Algeria
Saney Dam, Iran
Narekvari Dam, Georgia
Avsar Dam, Turkey
Grncarevo Dam, Serbia
Zarqa-Ma‘een and Lajjoun Dam, Jordan
Hydroelectric project El Tornillito, Honduras
El Cajon HPP, Honduras
UMA OYA Multi-purpose Project, Sri Lanka
Cheraghveys Dam, Iran

IN 25 YEARS MORE THAN 250 INSTRUMENTED DAMS

Waterproof tilt meter on Sogamoso Dam down-stream
Inclino-settlement column with magnet plate - Polrood Dam
VW Strain gauges installed in special rosette configuration - Ulu Jelay Dam

DISCOVER OUR WORLD ON WWW.SISGEO.COM

INFO@SISGEO.COM

VIA F. SERPERO 4/F1
20060 MASATE (MI) - ITALY
TEL. +39-02.95.76.41.30
FAX +39-02.95.76.20.11