RITE GEOSYSTEMS

ENCARDIO RITE METASENSING FOR MEGA STRUCTURES

Project Dossier

PROJECT DOSSIER

MANGDECHHU DAM

PROJECT OVERVIEW

The Mangdechhu hydroelectric project is a 720 MW run-of-river power plant being built on the Mangdechhu River in Trongsa Dzongkhag District of central Bhutan. Mangdechhu Hydroelectric Project Authority (MHPA), which is constituted by the Indian Government and the Royal Government of Bhutan, is developing the project. The project will comprise a 101.5 m high concrete gravity dam from the deepest foundation level, two intake tunnels of 196 m and 150 m length, and a 13.54 km long headrace tunnel capable of discharging 118m^3 of water per second.

The 152 m high surge shaft has diameter of 13.5 m. Water will be fed to the underground power house through two steel-lined pressure shafts (1,853 m long and 3.5 m in diameter). The main cavern of the underground power house will be 53 m high and 231 m long.

Project	**Mangdechhu Hydroelectric Project**
Location	Trongsa, Bhutan
Client	Mangdechhu Hydroelectric Project Authority
Contractor	Jaiprakash Associates Ltd.
Consultants	National Hydro Power Corporation Ltd. (NHPC)
Duration	2012-2018

Monitoring solution

Encardio-rite was awarded the contract for monitoring of dam, power house, intake, desilting chamber, surge shaft, pressure shafts and adits. Turnkey services included:

- Supply of geotechnical instrumentation for the dam and power house
- Installation services
- Online monitoring of critical parameters and areas
- Manual monitoring

INSTRUMENT USED

- **Piezometers:** To monitor uplift pressure below the dam & pore pressure of water in the dam body
- **Strain meter group:** To monitor concrete stress and strains
- **Perimetric and uniaxial joint meters:** To monitor linear movement between the block joints
- **Temperature meter** and tele-thermometer
- **Borehole extensometers:** Multi-point and single point installed to monitor deformations
- **Normal and inverted plumb lines:** To monitor tilt of the dam
- **Load cells:** Anchor bolt load cells installed to monitor load on anchors
- **V-notches:** To measure seepage water flow collected in drainage channels
- **Survey markers** and settlement points
- **Automatic data acquisition system:** Commissioned for logging data from above sensors
- **Strong motion accelerometer:** To monitor accelerations in earth due to reservoir seismicity
- **Web based data management system for online** presentation of data at client's desk

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