Permanent Strand Anchors for Changuinola Dam

PRODUCTS

DYWIDAG DCP Strand Anchors

DYNA Force® Sensors

UNIT

DYWIDAG-Systems International USA Inc., BU Geotechnics, USA

LOCATION

Panama

TIMELINE

2011-04-30

SCOPE

Supply

rental of equipment

technical assistance

OWNER

AES Changuinola S.A., Panama

ENGINEERS

MD & G Engineers, South Africa

The country of Panama is rapidly developing its economy, requiring ever increasing amounts of electrical power. The new Changuinola Dam has a capacity of 223 Megawatts or 1,046 GMH energy generation per year, increasing the country's electrical energy generating capacity by 50%.

Context

The Changuinola Dam is located on the Changuinola River in the northern part of the country. The dam owner is AES, a local subsidiary of the US based company.

Built on roller compacted concrete, the arch dam has a height of 99.2m, a length of 600m and a reservoir level located 165m above sea level.

Solution

The left dam abutment was characterized by weak rock that could collapse during reservoir water accumulation. The design engineer decided to stabilize that side by placing a reinforced concrete block tied down to good rock by 43 restressable 12-0.6” DYWIDAG Strand Anchors with double corrosion protection. Twenty four of these anchors which ranged in length up to 40m had two DYNA Force® sensors installed on their unbonded lengths to monitor anchor loading during the proof test, when water was rising inside the reservoir and during the life of the structure. DYWIDAG also provided an anchor uncoiler, a stressing jack assembly and technical assistance for proof testing and anchor load readings.

Readings taken during the filling of the reservoir and building pressure on the dam remained within normal limits, which provided a good indication that the anchors had been installed correctly. The combination of the DYNA Force® Sensor readings and anchor restressability provides the capacity to adjust the load at any time during the life of the structure.

Work on the dam began in October 2007 and was finished in the first quarter of 2011.