DANDO DRILLING INTERNATIONAL

CASE STUDY: Multitec 4000, Bolivia

In 2017 Bolivian electricity company Corani purchased a Dando Multitec 4000 for its drilling operations.

Nestled in the midst of a stunning landscape of mountains and lush flora in central Bolivia, the Corani SA Company (Corani) manage hydroelectric plants that provide electricity to the department of Cochabamba. A partnership of the national electricity corporation ENDE and private stakeholders, the company oversees two hydroelectric power facilities and all of the connected water resources. These include rivers, aquifers and natural as well as artificial lakes.

Over 35% of total electricity supply in Bolivia is currently provided by hydroelectric. Further expansion is in progress with the aim of exporting power as well as meeting national demands. Drilling is essential for Corani in the maintenance and development of the project.

The customer needed a rig capable of manoeuvring through tight spaces and difficult terrain into limited access areas, yet have the power to drill deeper than other small rigs on the market.

Requirements for the drilling program were manifold. They needed geotechnical information on the geology at depths of up to 150m with occasional 200m holes; they required site investigation tests including Standard Penetration Tests (SPT) to monitor existing infrastructure and prepare for new development along their waterways and dams; finally, they wanted information on aquifer resources and, in particular, needed to run Packer Tests to monitor hydraulic conductivity along certain sections of a drilled well.

The Multitec 4000 rig is ideally suited for this kind of work. The latest Mk3 version of the rig sits on a crawler base that is only 1.6m wide allowing access between closely spaced trees, boulders or buildings. The rig has been designed from the ground up to keep the centre of mass as low and as close to the middle of the rig as possible to ensure safe tracking over steep or undulating terrain.

Corani make use of the versatile rotary head and high speed wireline winch for coring, while the high torque of the head allows open hole boring required to install inflatable packers when conducting aquifer investigation.

Prior to their purchase of the Multitec 4000 Corani would contract outside companies to complete their drilling needs. Running their own rig has greatly reduced drilling costs and the efficiency of the design, which includes a special Bosch-Rexroth powered hydraulic system, ensures running and maintenance expenses are low.

The Multitec 4000 is a modular design and there are a number of rotary head options from 750rpm to 6000Nm of torque. The rig supports coring, RC, Aircore, DTH hammer and RAB drilling as well as conventional open hole mud rotary.

Corani often require angled boreholes so the mast dump facility and capability to drill between 45 and 90 degrees was essential. The Multitec 4000 comes with two mast options. The standard mast chosen provides 4 tonnes of pullback, however a heavy-duty option is equipped with 6 tonnes should greater depth of diameter be required. The

Corani drillers run 3m long drill rods and a swing out mast extension lets them trip two rods at a time in lengths of 6m to save time.

There are also multiple engine options. The latest MK3 version can be supplied with a Kohler 75HP Tier 4 Final which meets European and North American standards, and a Perkins 111HP Stage 3A for the rest of the world where the best quality diesel fuel may not be available.

As much of Corani's work is for site investigation around their hydroelectric infrastructure, a percussive hammer was fitted to the rig. This is mounted on a 3-position hydraulic carriage which allows the rotary head to be slid out of the way and the hammer unit into position. A 3rd position provides for a clear line of sight from the winch down to the borehole.

The percussive hammer is a special design that ensures the weight of the unit is supported above the drill string and therefore only the hammer strike drives rods during testing, providing more accurate results when the geotechnical engineers require SPT data. The hammer can also run Dando's Duplex Drive (3D) system which enables simultaneous casing and sampling in softer geologies where undisturbed samples are needed.

Sales Director Quentin Dulake is jubilant with what he considers to be Dando's best ever small rig: 'I think we've nailed it with the Multitec 4000 Mk3. This is not just a good multipurpose rig. We have the performance of a dedicated wireline rig, or a dedicated RC Aircore rig, or a dedicated RAB rig, all from one ultra-versatile platform.'

For more information on the Multitec 4000 as well as photos and video, please visit: **www.dando.co.uk/products/multitec-4000-multipurpose-rig**