



## Calope Hydropower plant

CALOPE PLANT - EQUADOR, SOUTH AMERICA

### TURNKEY ON-SITE OVERHAUL OF A HYDRO GENERATOR IN ECUADOR.

The Calope hydro power plant consists of two 9MW generators (720rpm - 6900V) coupled to Francis turbines. The plant started operation in 2006 and is operated by Enermax.

In 2014, after a period of continuous operation without major incident, a routine electric maintenance performed by Nidec Power allowed to detect weak resistance spots on one of the rotors, requesting an immediate overhaul of the machines windings.

Due to accessibility constraints, removing the alternators from the site would have been too time-consuming and complicated.

Nidec Power and Enermax agreed to perform all overhaul operations on-site.

To achieve this, Nidec Power built a temporary cleansing and steaming station right inside the building.

During 3 weeks, two technicians worked continuously to complete the following:

- Turbine disassembly
- Generator disassembly

- Generator washing and steaming
- Windings painting with special anti-flash coating
- Turbine maintenance
- Generator and turbine re-assembly
- Final alignment, testing and commissioning

The main issue had been addressed and the plant restarted on time without incident, but the teams on site still had to investigate on the root cause behind this early wearing of the windings impregnation.

After thorough inspection, technicians realized that the exhaust air duct was to blame.

The exit of the conduit was directly above the river, which caused significant condensation phenomena at each stops of the turbines.

Nidec Power consequently decided to modify the installation to remove the ventilation duct and install a filter on the air inlet net.

“ « This project demonstrates our capability to offer turnkey solutions for maintenance and overhaul. » said Nicolas Overbeeke, Service Engineer at Nidec Power. « It is also a good example of our commitment to get to the root cause of any issue to provide long-term solutions to our customers. We manage dozens of projects like this

one each year around the globe. What's exciting for us is that each situation is unique, with its own challenges and rewards. Of course, we are generators experts, but we also learn something new with each project we complete. I think this is also this experience that makes the difference. » ”

**Nidec Power Service is a global organization operating factory workshops in Asia, Americas and Europe to provide premium repair and remanufacturing services for all alternator types up to 40MW.**

**Supported by an international network of certified partners, the organization also supplies spare parts, maintenance and on-site intervention services.**



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