CASE STUDY

Turbo Generator Rotor Removal

Quartzelec design and manufacture a generator framework and rail system within the turbine enclosure, to facilitate the rotor extraction and retaining ring removal for a 2-Pole, 79,375kVA, 10.5kV, 3000RPM Twin pack Turbo Generator as part of a Major Inspection.

ENEL | POWER GENERATION | MAHON, SPAIN

Our Customer's **Challenge**

ENEL encountered the challenge of removing the rotor and retaining rings within the turbine enclosure of a 2-pole, 79375kVA, 10.5kV, 3000RPM Twin pack Turbo Generator. This complex unit, featuring turbines and auxiliary equipment at both ends, required the work to be carried out in situ, to facilitate a major overhaul of the stator and rotor.

The Quartzelec **Solution**

To address the challenge, Quartzelec designed and implemented a tailored solution, engineering and manufacturing a bespoke generator framework and rail system within the turbine enclosure to enable the safe and efficient removal of the rotor and retaining rings.

Precise measurements were taken, ensuring the rail system was custom-fit for the enclosure and given the absence of cranage within the turbine enclosure, specialised trolleys were designed to support the rotor throughout the extraction and retaining ring removal process. Additionally, a framework was constructed around the generator to facilitate the disassembly.

Once the rotor and retaining rings were successfully removed, both the stator and rotor underwent thorough cleaning, including the use of cryogenic cleaning techniques to safely eliminate contaminants without damaging components. Minor repairs were carried out as needed, and the generator was carefully reassembled to ensure reliable operation. A comprehensive suite of electrical tests was performed on both the stator and rotor, including Partial Discharge (PD), Tan Delta, EL-CID, and End Winding Bump Tests, to verify the condition and performance of the generator.

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Key **Benefits**

- Tailored Engineering Solution: A custom-designed rail system and framework enabled in-situ rotor and retaining ring removal, eliminating the need for extensive dismantling or external cranage.
- Minimised Disruption to Operations: The efficient design and execution of the solution reduced project disruption
- Enhanced Safety: Purpose-built trolleys and frameworks ensured safe handling and disassembly within the confined turbine enclosure.
- Major Inspection: The generator underwent a complete in-situ overhaul, including electrical testing, ensuring restored reliability and extended operational life.

"Quartzelec provided an excellent solution to a complex challenge. Their technical expertise and professional execution ensured minimal downtime and a successful return to service. Very pleased with the results."

Jorge Lucero Jerez, Técnico Gestor Mantenimiento Eléctrico, I&C Central Térmica Mahón

Custom Engineering

Enhanced Safety & Handling

Major Inspection

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