



MECHANICAL SERVICES FOR GAS TURBINES

GE LM6000PA™ Gas Turbine Disassembly & Fault Diagnosis

Problem

ENI UK Limited (ENI) operates two GE LM6000PA™ Gas Turbines on its Douglas complex (First production 1996). The units (GTA, GTB) are employed in a power generation application, and since their original installation have been maintained via an LTSA contract by the OEM.

During operation in 2023, it was noticed that the VSV lube oil system on GTA was losing pressure. Magnetic chip detectors were also indicating metal fragments within the system. The OEM advice was that the turbine may be suffering a bearing failure based on the metal fragments. However, it was HPI Energy Services (HPIES) opinion that this may not be the case due to the apparent pressure loss and suggested that the Auxiliary Gearbox Pump (AGP) should be removed and inspected.

Upon inspection it was found that the main drive shaft of the AGP had sheared. A replacement pump was fitted by the offshore team, but this also failed. After consultation with ENI, it was decided that HPIES should conduct a site survey to determine whether the Auxiliary Gear Box (AGB) could be replaced in-situ.

Solution

The site survey determined that an in-situ replacement of the AGB would be possible and two HPIES field service engineers conducted this work with ENI's spare (that was held by HPIES). The removed gear box was transported to HPIES' UK maintenance facility, where the unit would be stripped down and inspected.

HPIES' Specialist engineers disassembled the unit for inspection. The initial fault was determined to be a worn #2 spur gear ball bearing, located within the AGB.



Roller Bearing Outer Race



No. 2 Spur Gear Removed

This worn bearing caused axial misalignment on the AGP main drive shaft, leading to the failure. A condition report was produced for ENI.

The replacement unit ran with no pressure loss or mag chip indications.

KEY BENEFITS

Due to a sound legacy of success within the North Sea region and its familiarity supporting ENI on both mechanical and control disciplines, HPIES was approached to offer its solution.

By closely coordinating with ENI, HPIES was able to offer its support, tooling and workshop facilities to conduct the work in the UK, liaising closely with the client during the strip down process. This solution offered a number of cost and convenience benefits to ENI including:

- **Timely** – no delays or costs shipping the unit back to the gearbox manufacturer.
- **Convenient** – avoids ENI procurement team having to source another gearbox. HPIES had ENI's spare in its UK Facility.
- **Independence** – Inspection and fault determination conducted by an experienced team independent of the OEM
- **Successful conclusion** and job safely completed without utilising the OEM, offering a quicker and more cost-effective solution.

To see how HPI Energy Services can help you, please call us on +44 (0)1522 519944 or email info@hpienergy.com

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