

## Protecting Vessel Reliability Through Early Detection and Major Remedial Works

### Problem

Royston was initially contracted to carry out a 4,000-hour inspection on two Wärtsilä W6L34DF main engines and two Wärtsilä W6L20DF auxiliary generators onboard a vessel.

During the inspection, concerns were raised about possible water damage within the cooling system. A borescope inspection was carried out to assess the condition internally, but the level of sediment and debris within the system meant visibility was too poor to properly determine the extent of the issue. To allow for a more detailed inspection, a cylinder head was removed from one of the auxiliary generators. This confirmed that the coolant spaces were heavily contaminated with sediment, debris and evidence of water damage.

A cylinder head was then removed from one of the main engines, where the same condition was found. With contamination affecting both main and auxiliary machinery, it became clear that more extensive remedial work was required while the vessel was in dry dock.

### Solution

Following the inspection findings, the scope of works was expanded to include a full overhaul of the engines, power flushing of the cooling system, and complete rebuild works during the dry dock period.

As part of the overhaul, the auxiliary engine blocks also required machining due to the extent of the damage found. Given the level of water contamination present, Royston's lead engineer also recommended that the main bearings be dropped and inspected across all engines. This proved to be a critical decision, as the bearings were found to be heavily scored, with the crankshafts requiring hand polishing to restore condition and prevent further damage.

Once all overhaul, flushing, machining and rebuild work had been completed, two Royston engineers sailed with the vessel to carry out the 50-hour service on all engines, ensuring the machinery continued to perform as expected once back in operation.

### Result

By investigating the issue thoroughly and expanding the scope at the right time, Royston helped the customer identify and rectify serious internal engine damage before it developed into a much larger operational problem.

The decision to remove cylinder heads, overhaul the engines and inspect the main bearings across all units revealed levels of scoring and damage that could have led to significant engine failure if left undiscovered. Instead, the vessel left dry dock with its engines overhauled, cooling systems cleaned and flushed, damaged components rectified, and additional support provided during the critical early running period.

This proactive approach helped protect the reliability of both the main and auxiliary machinery and gave the customer confidence in the vessel's return to service.

