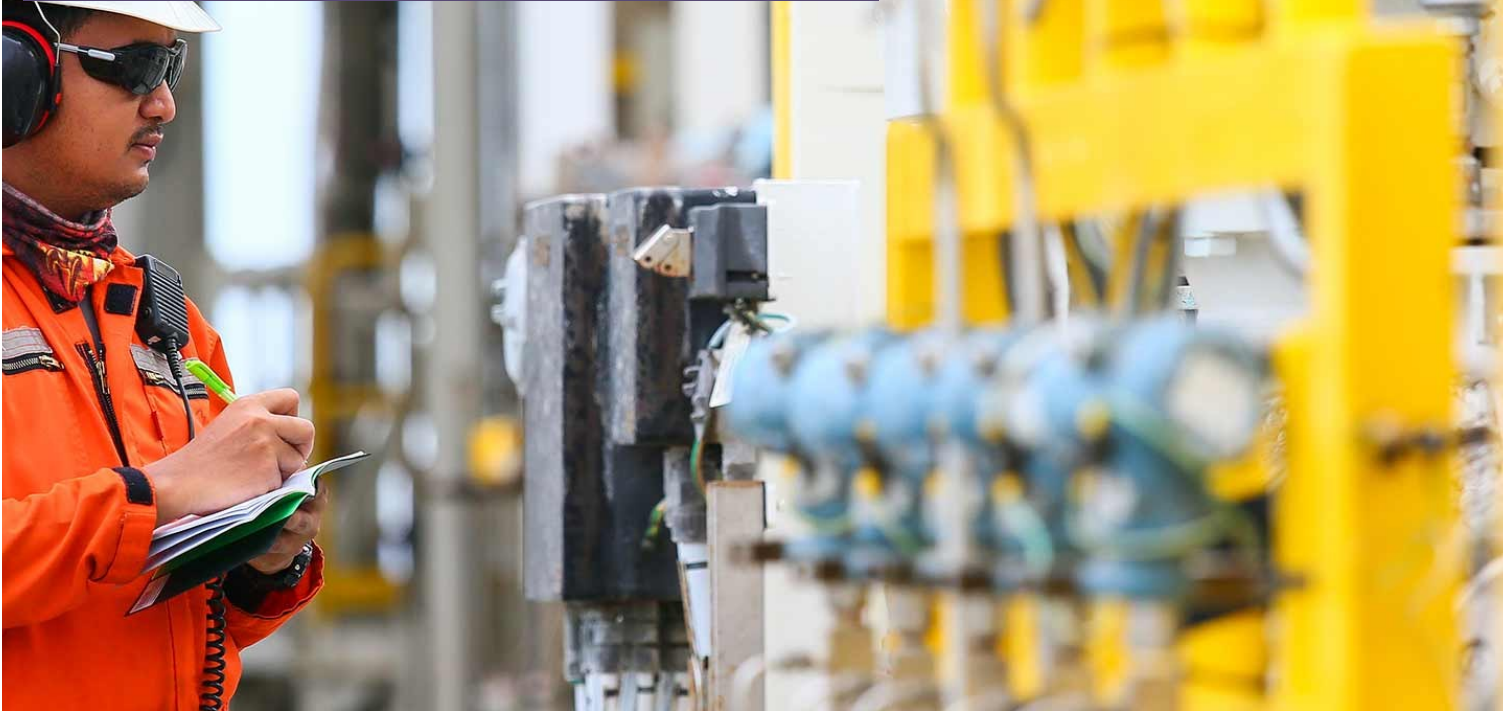


Case Study

## Control & Systems Upgrades



**CLIENT:** CONFIDENTIAL

**PROJECT:** Generator Controls Upgrade

### BACKGROUND

A key North Sea operator was looking to upgrade a problematic and obsolete control system on one of its platform generators. The generator was driven by a Rolls-Royce Avon 200 gas turbine and a EAS1-35 GEC power turbine. The Generator which has been in service since 1978 provides base load and supplies the power for the main gas lift and export compressor.

### THE PROJECT

Core were asked to provide the Control & Systems and Functional Safety expertise. The control system would need to be installed and commissioned within a planned TAR of 30 days.

The generator controls including the condition monitoring, consist of a GEC MK2 Governor Control, a Unit Control Panel (UCP), Excitation Control, Manual Synchronisation, Vibro-Meter Vibration monitoring and an Essential Supplies Controller as provided by GEC Turbines Ltd.

Additional control was implemented in solid state controllers from various suppliers.

The components were mostly obsolete and could only be replaced with refurbished spares or repaired and refitted. The exception was the excitation control which had new Brush controllers fitted.

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### CORE'S SOLUTION

A requirements specification was issued to approved gas turbine controls vendors, with the vendor chosen based on their technical proposal, cost and ability to deliver over a short project timescale of 12 months.

A detailed site survey was undertaken, with critical As Building of key documents carried out. It was then decided that to enable the generator to operate fully until the planned outage, the new control system would be installed in parallel with all cabling and instrument terminations to off-skid junction boxes tested back to the new system prior to TAR.

The control system was fully built and tested at the vendors premises before being shipped and installed offshore. The system was then tested by testing each field loop back from the field junction boxes to the control system while the existing system was still in operation.

During the TAR outage the GT engine and power turbine were removed and all instrumentation and original cabling was stripped from the skid.

The new junction boxes and instruments were installed in their final positions and all new instrumentation installed and tested.

This also included a new VFD starter and gas fuel skid. An engine and power turbine replacement was carried out and all instrumentation connected and functionally checked.

Commissioning was carried out over 3 days and the generator successfully returned to full service.

- Design Approval & Functional Safety Assessment
- Engine Governor upgraded to Allen Bradley PLC
- Sequencer upgraded to Allen Bradley PLC
- Vibration/Condition monitoring upgraded to Vibro-meter 600
- Overspeed Protection Upgraded to JAQUET FT3000
- Fuel Control Valve Upgraded to Heinzman EVOII
- All Instruments upgraded, analogue transmitters replacing switches.
- New fire & gas system installed with a Tyco R4 unit.