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PROJECT SUMMARY

DATE	6 December 2002	**LOCATION**	**Marathon Oil UK Limited** **Brae Alpha Platform, Off Shore North Sea , UK.**
SUBJECT	**OLYMPUS GAS TURBINE CONTROL SYSTEM RETROFIT**		

Marathon Oil operate three 20.0 MW dual fuelled simple cycle Rolls Royce Olympus gas turbine driven generators for power generation on their Brae Alpha platform located in the North Sea Sector East of Aberdeen. Originally installed in the early part of the 1980's (four Olympus Generating were installed, one is now mothballed) the generation on the Brae Alpha was later linked by sub sea cable to the generation capacity available on the nearby Brae Bravo Platform, which has three Rolls Royce RB211 Gas Turbine driven generators each rated at 24 Mw.
This interlinking provided a substantial generating capacity controlled by a Power Management System (PMS) for the Brae Alpha and Brae Bravo platforms, together with the adjacent Gas Compression system located on the East Brae platform, which is also linked by sub sea cable.

As part of the Marathon Project Solstice, which was introduced to achieve a step –change reduction in the cost of operating the Brae field, the Generator Control Systems were upgraded to provide more reliable and supportable systems, with the aim of providing easily accessible information and diagnostics, both locally and at Remote locations, thus reducing the requirements for specialist knowledge to be available Off Shore.

In addition to reliability issues, some of the installed control equipment was obsolete and the skills and knowledge required to maintain the system were in short supply.

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Registered Company No: 1947922 VAT No: GB 424 3986 37
FILE REF. PROJECT SUMMARY MARATHON BRAE ALPHA NEW HEADER

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The Problem

Unreliability is a result of the combination of the original design based on technology of the time and the ageing process. Fault finding is restricted primarily to available information of the fault and its possible cause.
The main sources of unreliability were readily identified as:

- The electro hydraulic fuel control system and associated high pressure hydraulic pack.
- Automatic sequencing control and annunciating system.
- The analogue display and control units.

The Solution

Turbine Controls Ltd were contracted to provide a solution that would meet the required increase in reliability and enhance the diagnostic capabilities of the units. The control system retrofit consisted of: -

- The fuel control governor, temperature spread monitor and automatic sequencer control systems were implemented using a PLC based system using Allen Bradley ControlLogix 5000 PLC family.

- The Olympus associated electro-hydraulic Liquid Fuel metering valve was removed and replaced with the TCL Posiflow off engine liquid fuel system, using a variable speed electrically driven gear fuel pump to modulate the liquid fuel to the Olympus engine.

- The Olympus Gas Fuel Valve was modified by removing the electro hydraulic actuator, and replacing this with a positioner electric motor and gearbox assembly, together with a dedicated position controller.

- A number of additional transmitters were installed to replace / supplement the existing pressure switches on the auxiliary systems and provide monitoring and display of parameters via the PLC.

- SCADA system providing local control and remote monitoring. The SCADA was implemented using Ethernet communications. SCADA system also provides detailed alarm reporting and diagnostic tools to aid in fault finding. The Local PLC controllers for each machine were connected via an Ethernet Link to a monitoring PC located in the Brae Alpha switchgear room.
  This PC provided monitoring and data archive for all 3 machines.
  The link was extended via a Router to allow a PC located in Marathon House Aberdeen to also monitor and archive the data from each machine. The system has the capability for TCL to provide remote diagnostics if required, via a modem link.

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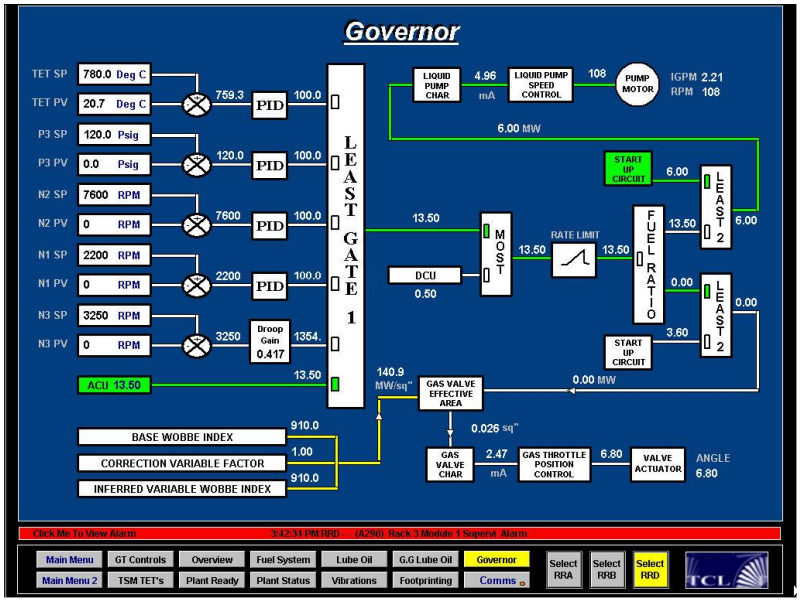

Governor Screen Details

TCL were responsible for the design, manufacture, installation and commissioning for all equipment supplied under the contract. The installation and commissioning of the new equipment on the first unit was completed in November 2001. All software for the PLC and SCADA systems was written and tested by TCL engineers at our Leicester HQ.

TCL continue to provide technical assistance and support to our customer Marathon Oil.

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