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PROJECT SUMMARY

DATE	30 th October, 2000	LOCATION	Ballylumford Power Station, Northern Ireland
SUBJECT	GAS TURBINE CONTROL SYSTEM RETROFIT		

The Problem

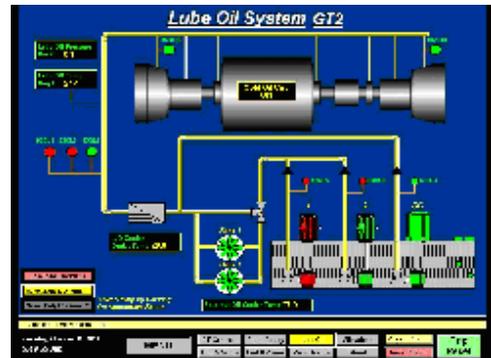
To increase the start reliability of two liquid fuel Gas Turbine generating sets from 80% to >95%.

Ballylumford Power Station operate two 55 MW diesel fired simple cycle gas turbines for peak load duties. Each gas turbine consists of four RR Industrial Avons exhausting into two power turbines, which power a single AC generator. The gas turbines run at infrequent intervals, 1 – 2 times per month and are required to start and reach full load at short notice, typically 4 – 6 minutes. Income for the gas turbines is based on start reliability over a 12-month period, with a sliding scale as reliability decreases.

This running regime places a high demand on start reliability. The Power Station identified that with a relatively small increase in start reliability typically from 80% to >90% the Gas Turbine revenue could be increased dramatically.

The Solution

TCL were contracted to provide a control system solution to the above reliability problem. Initially two areas of the plant were identified as potential sources of unreliability, the governor and sequencer control equipment and the Avon on-engine mechanical control system. The final solution entailed the following: -



- The Governor and Sequencer control systems were replaced with one PLC based system using the latest technology Allen Bradley ControlLogix 5000 PLC.
- The Avon on-engine hydro-mechanical fuel control system was replaced with the TCL PosiFlow off-engine system using a variable speed electrically driven HP fuel pump to modulate fuel to the Avon.
- SCADA system with local and remote Operator screens utilising an Ethernet communications network with a fibre optic link to the Power Station main control room.



TCL acted as main contractor for the Project completing the design, manufacture, installation and commissioning of all the equipment supplied under the contract. All software for the PLC and SCADA system was written and tested by TCL engineers at our Leicester works.

The equipment was installed and commissioned to a tight plant outage period of 4 weeks. The installation involved co-ordination of cabling and pipework contractors.

The start reliability for year 2000 to date is 100%.