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Project Profile
GE Frame 5 Gas Turbine Control System

Proeon Systems were asked to provide the software control systems for a twin shaft GE Frame 5 Gas Turbine generator set installed by Hans Kjellerup in Esbjerg, Denmark. The system is designed for remote unmanned operation and reliable and repeatable starting of the engine was a key design requirement.

The engine was relocated from a site in Trondheim, Norway, and the opportunity was taken to replace the ageing GE Speedtronic MkII control system with state of the art Siemens PLC technology with a WinCC HMI.

The use of the Siemens PLC hardware and software platform allowed a distributed Profibus I/O system to be placed around the turbine and the generator. This minimised the resulting cable runs back to the new turbine control panel. New instrumentation was fitted to augment the standard engine equipment and to provide improved diagnostics and control.

Independent overspeed protection was provided through separate dedicated overspeed monitors on both the HP and LP shafts to provide backup speed protection to the software protective functions.

Bentley Nevada BN3500 vibration monitoring systems provided monitoring of sensors on the turbine gearbox and generator.

The software control system provided robust control of the engine governing, exhaust gas temperature monitoring and engine sequencing.

Proeon Systems provided the detailed design specifications as well as the engine control software and HMI designs together with the migration of the control algorithms and settings from the existing Speedtronic control system. The resulting control system provided a highly configurable set of engine control algorithms that allowed the engine to be set up through software tools on the HMI.

The HMI is based on the Siemens WinCC PC based HMI package and the HMI provided graphics displays and operator controls for the turbine and generator together with alarm and historical trends and remote access for diagnostics.