Kyndby Power Station in Hornsherred is the emergency and peak load facility for Zealand. Operated by DONG Energy, one of the leading energy groups in Northern Europe, the 734 megawatt (MW) capacity Kyndby station’s facilities can be started up within minutes if operational irregularities occur in the high-voltage electricity grid, or problems arise at other power stations.

Built in 1972, Kyndby serves as a black start unit for the Danish grid. Its facilities include two GT13B gas turbines with an output of 63 MW each, which in 1995 were converted to the Procontrol P13 control system. An old Praut 8013 was used for remote control from the control room located 500 meters away.

The customer wanted to modernize the plant’s control system. A solution came through the close cooperation of ABB Switzerland and ABB Denmark. ABB Switzerland supplied a complete P13 control system (hardware and software) featuring Progress III and P13 Connect to operate the black-start unit; ABB Denmark supplied and configured 800xA operations, and took the role of project manager.

Also included in the plant facilities are two ship diesel engines with an output of about 12,000 hp each and originally a conventional control system (not from ABB), as well as two Bastan VII gas turbines (aircraft engines) rated about 1,000 hp each, with control systems from Turbomach SA.

Finally, Kyndby power station controls one GT13C gas turbine situated at Masnedo CHP plant about 100 kilometers away, with an output of about 70MW and an ABB Decontic control system. The customer wanted all machines in the plant to be operating under the same control system, and also wanted a remote control capability from the main control room in Kyndby.
Each of the local HMI stations had to function in stand-alone operation.

as well as high availability, reliability, and clearly structured programming.

This required an overhaul of the ABB P13 control systems in the two GT13B gas turbines, supplementing them with additional features and redundancy; replacing the old UA379 speed measurement modules with 70E105 units and new encoders; and upgrading the engineering tool to Progress III, in order to upgrade the Praut 8013 control stations to 800xA operations for local and remote control.

For all other machines, the upgrade required installation of a new P13 control system featuring a new speed measurement module and the latest ABB HMI system for local and remote control, as well as Progress III for diagnosis and maintenance. The challenges of this type of upgrade included the fact that the control system for the turbo-engines had to be a top performer because of the high speeds and extremely short start-up phase involved (less than two minutes).

Additional challenges included the fact that the gas turbine in Masnede is about 100 km away as the crow flies, so access via HMI and Progress III had to function reliably, as must the transfer of individual P13 local bus signals via the BK06-BK06 connection and TCP/IP.

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