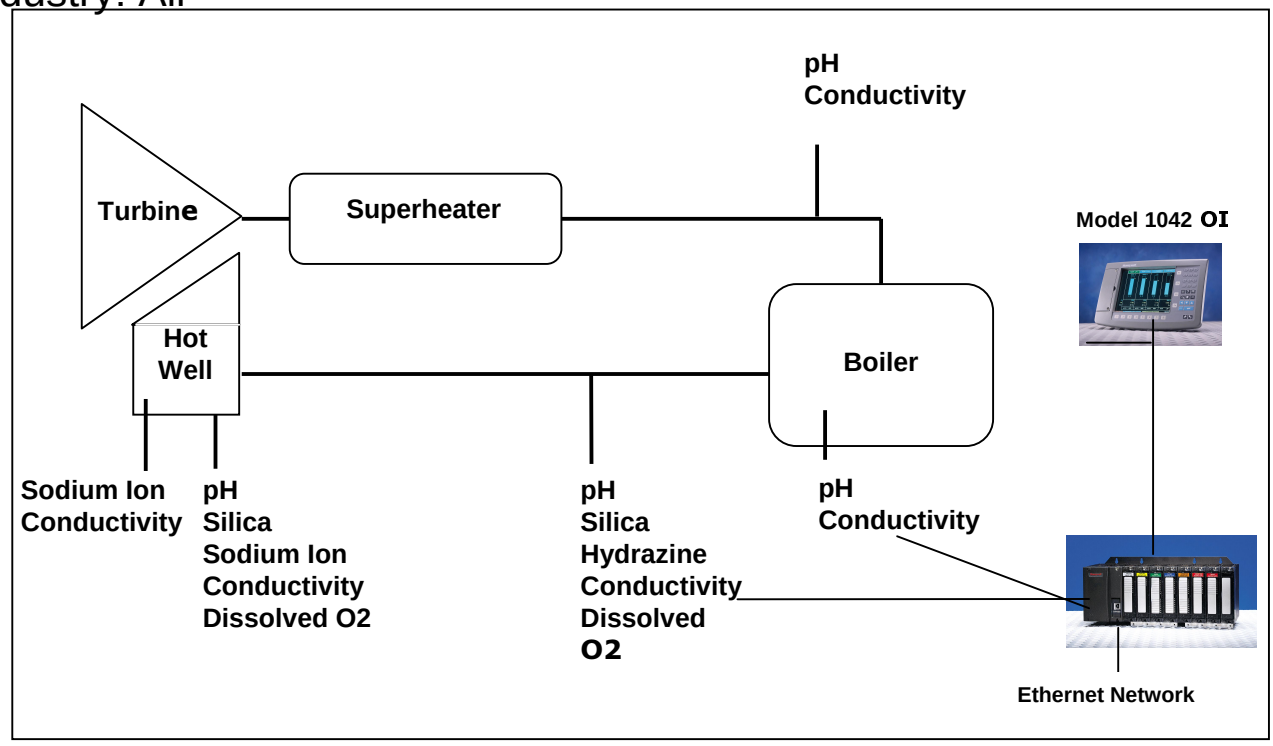
HC900 Boiler Water Chemistry

Application Brief

Industry: All



Problem

Water quality and steam purity are important considerations for ensuring availability and reliability of power generation components. Turbine blades, discs, boiler tubes, condensers, feedwater heaters, and condensers can experience corrosion and scaling problems if boiler water chemistry is not properly controlled and monitored.

Recognition of the cost savings available from improved water chemistry management has lead to increasingly stringent standards for water quality measurement and control.

Measurements are taken at numerous sample points throughout the water/steam cycle. Typical measured variables include pH, conductivity, dissolved oxygen, silica, hydrazine, and sodium ion. The measurements must be continuous and provide timely alarms so that corrective actions can be taken to maintain water quality.

The HC900 Solution

The HC900 Hybrid Controller offers an ideal solution to meet the total needs for water quality management. The HC900 accepts inputs from online analyzers and combines them with manual entries such as grab sample analyses to allow easy and automatic integration of all parameters required for water quality management.

The HC900 integrates continuously variable control functions with the discrete functions to manipulate any variety of final control elements required for water chemistry management.

The standard logic capability of each HC900 can be used to enhance alarm strategies to include startup/shutdown and special circumstances.

The interactive Operator Interface displays assist when operator intervention is required by its ability to generate easily recognizable alarms. The ability to group data assists in identifying the location where corrective action is to be taken.

When remote access to data is needed by plant personnel, HC900's open direct Ethernet connectivity allows most third party industrial software to be used for this purpose. Either the Modbus/TCP protocol driver or an OPC server can be utilized for HMI support, interface to a plant historian on the network, or to a DCS.

Benefit Summary

The HC900 provides outstanding benefits when applied to advanced water chemistry management:

- Distributed architecture permits controllers to be installed near the sampling panel, thus reducing installation costs.
- Excellent operator interface for both operators and laboratory personnel
- Identification of existing and developing trends from real-time and historical data.
- Increased speed of operator response
- Definition of water and steam variations attributed to startup, shutdown, cycling, and peaking operations
- Definition of current operating ranges
- Definition of optimum operating ranges for cycling and non-cycling operation

Implementation

Overview - The HC900 as shown in Figure 2 consists of a panel-mounted controller, available in 3 rack sizes along with remote I/O, connected to a dedicated Operator Interface (OI).

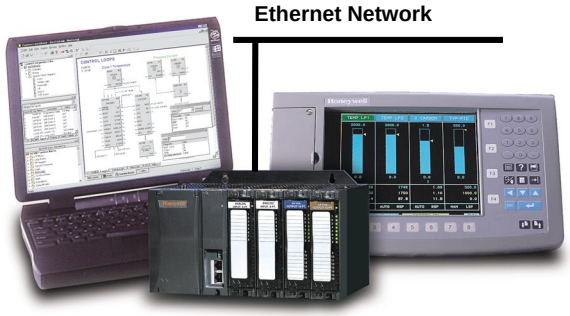


Figure 2: HC900 Hybrid Controller, Model 1042 OI and Hybrid Control Designer Software

All field signals terminate at the controller. The controller has universal, isolated analog inputs, analog outputs and a wide variety of digital input and output types. In addition, there can be up to 4 remote I/O racks. Up to 512 I/O with 256 analog inputs are supported. This controller will provide all the water monitoring functions including calculations, loop and logic control as needed.

Configuration. The Hybrid Control Designer tool supports advanced graphical configuration techniques to allow a variety of strategies to be easily implemented. The large library of function blocks that are soft-wired (over 100 types and 2000 blocks) support the water chemistry application. The run-mode configuration monitoring and editing capability allows these strategies to be tested and refined on-line as process knowledge is gained.

Monitoring. The complete operation can be monitored and controlled from the easy to use, familiar displays of the Model 1042 OI.

Data Storage. The data storage feature of the OI can be used to log process information during the cycle to an integral floppy disk for a permanent record.

Open Connectivity Over Ethernet. Use popular HMI, data acquisition, OPC server, and HC900's HC Designer configuration software over an Ethernet LAN concurrently to access HC900 controllers via Modbus/TCP protocol.

Peer to Peer Communications. Any HC900 can support up to 8 peer controllers for exchange of analog or digital data over Ethernet.