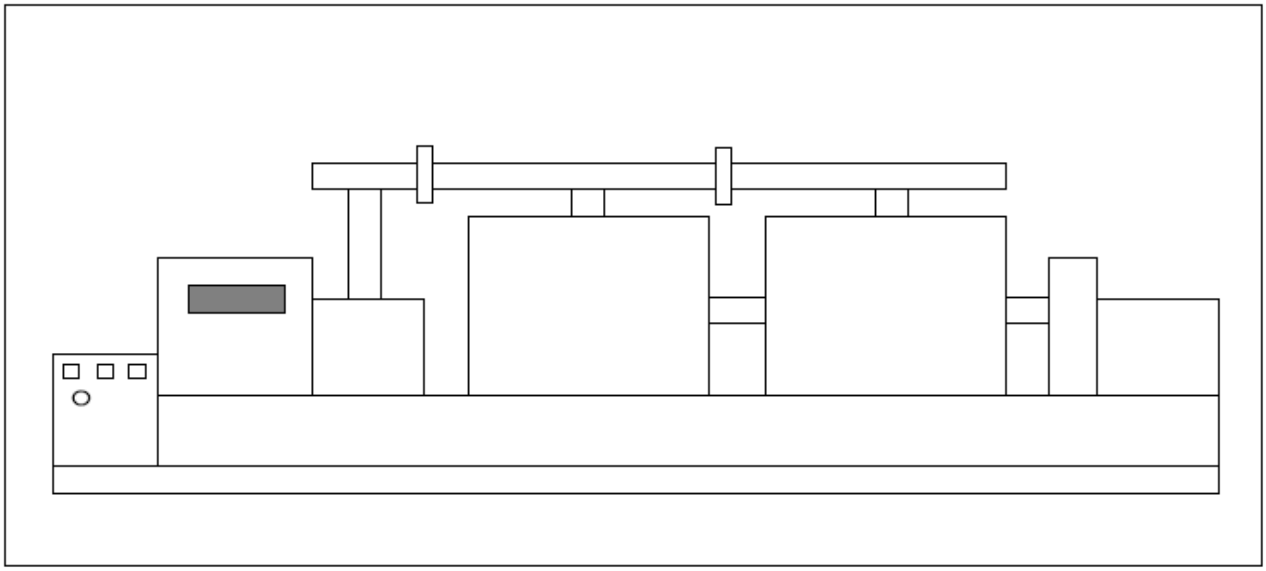
Solution Note

Honeywell

HC900 Turbine Generator Monitoring
Industry: Utility



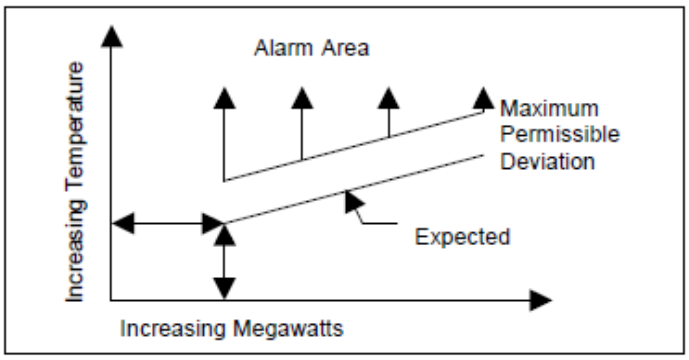
Problem

Modern operating practices, which increase stresses on equipment due to cyclic and peaking operation, demand more comprehensive equipment performance monitoring. Improved monitoring enables operators and engineers to take predictive actions in response to changing turbo-machinery conditions.

Generator units called upon to cycle load or peak must respond safely or quickly. The imposed stresses make temperature monitoring critical. Experience has shown that proper monitoring of stator winding temperatures during startup and steady-state operation makes it possible to detect abnormalities and take corrective action before major damage occurs. New equipment is often provided with a “fingerprint” of normal characteristics to aid in the detection of abnormalities.

Generators may be equipped with a combination of Resistance Temperature Detectors (RTD) and thermocouples (TC) to measure temperatures at stator windings, armature, connector rings, bushings, and hydrogen temperature. Stator winding measurement points may be between the top and bottom coils at the sides in the stator slot, or in the coolant discharge; an equal number of sensors is used for each winding phase. During operation, these sensors provide a profile – a temperature pattern – of the stator winding. This profile is more informative than actual individual temperatures and a change inpattern can indicate developing problems such as high resistance, unusual circulating currents within a phase group, a change in current distribution within the coils of a phase group, or a change in cooling parameters.

The temperature monitoring system must interface with the sensors, acquire all the necessary data, make appropriate calculations, and alert the operator to the possible need for corrective action.



The HC900 Solution.

The HC900 Hybrid Controller provides an ideal solution to the stringent challenges of today's generator temperature monitoring standards. HC900 uses a distributed I/O architecture which allows I/O racks to mounted close to the measurement points to minimize installation costs and problems associated with electrical noise. Sensors can include direct connected RTDs and thermocouples.

The HC900 provides the unique ability to perform dynamic alarming required for startup, cycling and steady state operation. The HC900 also provides logic functions to enable any alarm status to be annunciated remotely, posted for view on the Model 1042 Operator Interface and stored locally for permanent record.

Benefit Summary

- The Honeywell HC900 provides the following benefits when used in turbine monitoring applications:
- Extensive set of advanced algorithms for maximum process performance
- Open Ethernet connectivity via Modbus/TCP protocol provides plant wide process access and data acquisition
- Extensive equipment diagnostic and monitoring to maximize process availability
- A common configuration tool for both control and OI minimizing engineering costs
- Isolated, universal analog inputs allow mix of analog input types on same card, saving I/O cost
- Interactive color Operator Interface for local monitoring
- Low installation costs

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).

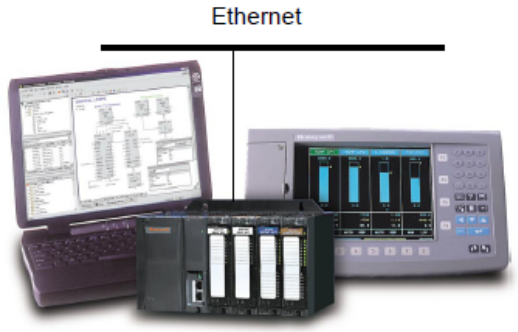


Figure 2: HC900 Hybrid Controller, Model 1042 OI and Hybrid Control Designer Software

All field signals terminate at the controller. The controller has universal analog inputs, analog outputs and a wide variety of digital input and output types. This controller will provide all the turbine monitoring control functions.

Configuration. The Hybrid Control Designer tool provides advanced configuration techniques allow a variety of strategies to be easily implemented. The run-mode configuration monitoring and editing capability allows these strategies to be tested and refined 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.

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

More Information

For more information on HC900, visit www.honeywellprocess.com, or contact your Honeywell account manager.

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SO-12-28-ENG
April 2012

Honeywell