Design · Construction · Integration

TEST SOLUTIONS
EQUIPMENT & SYSTEMS
INSTRUMENTATION & CONTROLS
FACILITIES & CONSTRUCTION

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CASE EXAMPLE

Central Facilities & Safeties for Four R&D Test Cells – a Rockwell Solution

Application: Process Control, Facilities Control

ACS ROLE

Turnkey Services – managed design, fabricated control panels, procured field devices, managed installation, performed PLC and HMI programming, performed startup & commissioning.

PERFORMANCE FEATURES

Programming – Controlled central combustion and dilution air system to four engine test cells, two 40-degree chillers, and two 20 degree chillers. Controlled the following systems for each cell: clean steam generator, cell ventilation system, combustion air trim box, engine exhaust system to simulate altitude, variable temperature water intercooler system, jacket water system, and engine fuel conditioning.

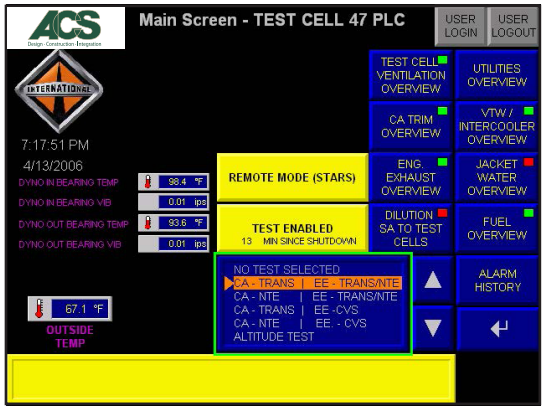
Platform – Four Allen-Bradly Compact Logix Processors – The Test Cell PLCs control all peripheral systems associated with the testing and control of a specific test cell.

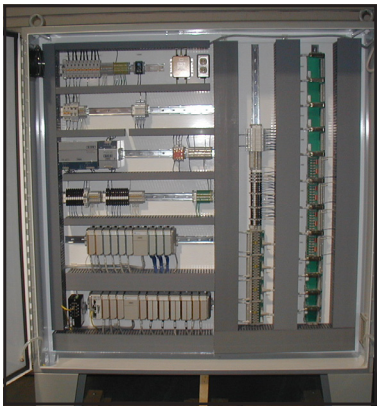
One Allen-Bradly Compact Logix Processor - The Utilities PLC controls multiple systems designed to supply four test cells with conditioned combustion, dilution, and facility air.

Over 800 I/O points

Commissioning – ACS self-performed the startup and commissioning.

Panel Build – Four Test Cell PLC panels with a panelview-plus 1000 HMI per panel. One Central Utilities PLC panel with one remote flex I/O panel and a panelview-plus 1000 HMI.





Field Devices – Provided all instrumentation and field devices connected to the PLCs.

DESCRIPTION

Challenge:
The client wanted to operate the central facilities from any one of the four test cells without interrupting current testing in another test cell and to easily adjust cell-specific control parameters from one location in the control room. Engine testing required simulating altitude conditions at the engine from 700 to 12000 feet above sea level.

Solution:
ACS provided a complete system including a Utilities PLC to control multiple systems designed to supply the four test cells with conditioned combustion, dilution, and facility air and four Test Cell PLCs to control all peripheral systems associated with the testing and control of a specific test cell.

The Utilities PLC controls the heating, cooling, and dehumidification of combustion air by utilizing two air handling units, each up- fitted with a Munters dehumidification system. The PLC also controls the two dilution air handling units for temperature, humidity, and pressure control to all four test cell dilution air tunnels. The Utilities PLC maintains the supply air temperature to the corridor, emissions rooms, and test cell control rooms.

The Test Cell PLCs control all peripheral systems associated with testing and control of a specific test cell. Test cell systems include combustion air, engine exhaust, fuel, variable temperature water, jacket water, and test cell ventilation. The Test Cell PLCs interface with the cell data acquisition system (Stars) to give the user a one-system approach to enable and manipulate setpoints. The user can take local control of the PLC via the panelview-plus touch screen. Once local control has been taken, a user can either enable one out of the five tests available, or enable an individual system.

All five compact logix processers were networked together so the test cell operators could operate and see the status of central systems from any one of the test cells.