



Circon Integrator: **Holiday-Parks, Inc, Seattle, Washington**

Building Type: **Aerospace Facility, aviation service center, maintenance repair and overhaul**

Physical Description: **4 hangars, one mixed use industrial / office**

Duration of Project: **6 weeks**

THE CLIENT

A global aerospace company specializing in the repair and overhaul of aircraft and component parts. This facility offers the largest breadth of Maintenance Repair and Overhaul (MRO) services of any aerospace supplier in the world.

THE CHALLENGE

- *Immediate and ongoing reduction in energy usage and utilities demand*
- *Allow for future integration and expansion of existing and new systems*
- *Install a filtration monitoring and alarm system to meet stringent agency specifications and to ensure compliance*
- *Ability to schedule for individual areas*
- *Facilitate phased implementation of mechanical systems as well as the addition of new systems and buildings*
- *Ensure network security*

The existing proprietary DDC controls system was dated, failing and suffered from poor commissioning. This resulted in high energy costs and an inability to update the systems and its components with best of breed products, coupled with inappropriate environmental conditions within the facility. Area temperature control needed to be defined and available to accommodate a range of different zones and requirements including large hangars for painting jumbo jets and individual office space.

A single network integrating the HVAC controls, the paint area exhaust filtration monitoring system, and future expansion needed to be built capitalizing on existing campus wide TCP/IP Ethernet based network.

THE SOLUTION

- *Circon hardware and software for an integrated facility automation system*
- *Echelon[®] LonTalk[®] over IP routing technology to facilitate existing network infrastructure*
- *LonWorks[®] network allows unlimited capacity for future control function expansion*
- *Danfoss LonWorks based Variable Frequency Drives*
- *Custom graphics to record filter performance and emissions in addition to the vast array of comfort points serving both office and industrial spaces*

The fully integrated facility automation system solution provided by Holiday-Parks was chosen because of the ability to integrate multiple systems on a single LonWorks network, allowing for best of breed expansion while maintaining the Open Systems model.

Paint area exhaust filtration monitoring is vital as environmental regulations concerning effluents and pollutants are stringent. Detailed and specific controls are in place to ensure that exhaust readings remain within allowable environmental regulations concerning effluents and pollutants during run-time. All measurements are recorded both on the Environmental Control System as well as a back-up chart recorder matrix. The system dispatches an alarm to personnel and on-call service representatives to replace the filters as needed, and will shut down the ability to produce effluent should an alarm condition exist.

The largest set of energy savings was derived from the control of 310,000 CFM of conditioned air to the 56,000 sq foot (7,280,000 cubic foot) aircraft painting facility. Industrial conditions dictate a space temperature in excess of 110° F in the space, while using 100% outdoor air and a rapid temperature acceleration ramp-up. Also required was the ability to maintain a negative space pressure relationship with respect to the remainder of the facility. Further control was required to assure a defined range of differential pressure as measured across all of the six banks of exhaust filters.

THE DETAILS

HVAC CONTROL

- *Provide efficient, measurable and reduced energy usage*
- *Precise environmental control in specified areas*
- *Deliver intelligent monitoring and control*

The facility invested \$230,000 to update various HVAC components and part of the industrial control system. The local power authority reimbursed 70% of this investment as part of their energy savings incentive program, allowing for a capital expenditure of approximately \$68,000. The facility is now realizing annual conservative energy savings of \$170,000 on electrical billing and \$350,000 in natural gas billing while exceeding agency effluent standards. An added bonus to the retrofit was a precise definition of the process' required to deliver a quality paint job on an airplane, and the addition of flexibility of the system to its users, while simplifying the controls interface.

SYSTEM MANAGEMENT

- *Single system to monitor the whole facility*
- *Immediate notification of alarms to on-site personnel*
- *Echelon routers effectively handle and stabilize overall system connectivity*
- *Updated filter monitoring with differential pressure sensor, alarm trend and PID control of associated exhaust fans*

By integrating the Echelon i.LON® 1000 LonTalk over IP routers to the existing TCP/IP Ethernet, the facility was able to save additional re-wiring costs.

If the measured filter differential pressure, as determined by sensors mounted near the filters, exceeds an allowable run-range the Circon controls system will sequentially initiate a warning light on the booth, sound a horn in the hangar, initiate an alarm on the user interface, and automatically alerts Holaday-Parks to dispatch a service representative to change the filter. If conditions continue to deteriorate, the Circon system will shut down the compressed air required to apply the paint to the aircraft. To avoid the high cost of a system shut down, a service representative is available 24 hours a day, 7 days a week. A local data logger integrated with Circon customized software produces detailed charting of records as a back up log and evidence for the environmental regulating authority concerning filter performance and emissions. The solution provided by Holaday-Parks is seen by the EPA as the most efficient installation and record keeping program they have reviewed to date.

SYSTEM COMPONENTS

Circon Programmable HVAC Air Handling Unit Controller
Circon Programmable Terminal Unit HVAC Controller
Circon Terminal Unit VAV Controller
Circon Unitary HVAC Controller with Roof Top Personality
Circon Programmable Unitary HVAC Controller
Circon LON Integrated Node Connectors
Circon Site Management Controller
Circon System Integrator Software
Circon Visual Integrator Software with customized graphics
Echelon i.LON 1000 LonTalk over IP routers
Continental Control Systems Watt Node
DanFoss Graham Variable Frequency Drives

For more information about this case study, please call us at 1-800-338-1866.

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