



Installation: **GE Industrial Systems, Plainville, Connecticut**

Circon Integrator: **Enertech Inc, Hawthorne, New Jersey**

Building Type: **Office, production, research, and warehouse**

Physical Description: **10 buildings – 3 stories, plus basement, 244,000 sq. ft.**

Duration of Project: **April 1999 – October 1999**

THE CLIENT

GE Industrial System's headquarters in Plainville, Connecticut is comprised of a 10-building complex which houses office, warehouse, manufacturing and production space totaling 244,000 sq. ft. over three stories. Both the office and production areas are often occupied at all hours of the day.

THE CHALLENGE

- *Immediate and ongoing reduction in energy consumption and demand*
- *Integrated control of both HVAC and lighting systems – which previously operated as independent systems*
- *Absence of area schedules created unpredictable and uncomfortable space temperatures*
- *Multiple systems to be managed through single central management system*
- *Implement open protocol building automation system for future multi-vendor expansion*

GE Industrial System's (GE) primary concern was reducing their energy consumption, not only for the immediate savings but also to qualify for a Connecticut Light and Power (CL&P) utility rebate for which GE had to prove increased future energy efficiency. The existing HVAC units, of varying vintage, operated independently which was costly and needed improvement. As part of the challenge, the lighting system, a significant energy consumer, had no interaction with the HVAC system. Further, individual area comfort was almost non-existent. GE sought to implement an integrated system that would not only effectively monitor and manage their energy consumption, and quickly pay for itself in doing so, but also allow for future expansion.

THE SOLUTION

- *Implementation of Circon's Integrated Building Automation System provides integrated control of HVAC and lighting systems*
- *Circon's Visual Integrator™ software allows individual scheduling of HVAC and lighting for each area of the complex resulting in increased comfort and an immediate improvement in energy efficiency*
- *Front end workstation programmed with Visual Integrator provides centralized management to monitor, control and override any area of the complex*
- *LonWorks® based technology provides a solid platform for future expansion of applications such as card access and security system devices*

Circon controllers installed in 33 rooftop units and 280 lighting circuits are connected together to create a complex-wide LonWorks network. The system is configured with more than 30 zone schedules, each tailored to meet the needs of individual departments within the facility. Zone schedule adjustments affect both HVAC and lighting systems and reduce occupancy overrides resulting in increased comfort levels and energy savings.

The HVAC controllers contribute further to reduced energy consumption by monitoring outdoor air vs. indoor air enthalpy and take advantage of "free cooling" opportunities during the milder months. Circon BASIC language, used to program the sequence of operations for many of the controllers, allows HVAC and lighting systems to operate at peak efficiency and optimize the load handling around the clock.

GE Industrial Systems realized an immediate increase in control of their building automation system. Circon's Visual Integrator™ software, with point and click maneuverability, provides an easy to use central management system for GE's in-house facility managers. Visual Integrator allows total monitoring control, with the capability to view real time information and to change operating schedules of systems and devices. The system can be programmed, maintained and supported remotely.

For future expansions GE will be able to receive competitive bids for maintenance, service and system additions because of Circon's open protocol building automation system in place today.

"Monitoring HVAC and lighting functions across the site from a single location is a significant productivity benefit for this department." **Jonathan Dahlstrom**, Facilities Coordinator

PAYBACK and SAVINGS CALCULATION

It was established that the implementation of this system would save approximately 1.3 M Kilowatt-Hours annually. As a result, GE would qualify for a CL&P utility rebate in excess of \$70,000.

CL&P verified by runtime audit and computer simulation that there was an energy reduction on the controlled equipment. Calculations are outlined below.

LIGHTING SUBSYSTEM

- $[(\# \text{ of Loads}) * (\text{Loading factor (Amps)}) * (\text{Voltage}) * (\text{Previous Runtime} - \text{New Runtime (Hours)})] / 1000 =$
KWH saved per period
- *Other than loading factor all of the above were definitive quantities. Using a fairly conservative figure of 4 amps yields approximately 57,000 KWH saving per month*

HVAC SUBSYSTEM

- *CL&P used computer simulation based upon data such as: type of area (office, warehouse, production), percent occupancy and types of controls employed*
- *The utility determined that based upon data provided and their audit, more than 500,000 KWH would be saved annually*

Conservative estimates for annual savings for the controlled rooftop AC units and the lighting circuits are approximately 1.3M KWH per year. At an approximate rate of \$0.06 per KWH, this yields an annual dollar savings of \$ 78,000 per year. This savings represents a payback period of 1.96 years – with the CL&P rebate factored in the payback period is 1.1 years.

SYSTEM COMPONENTS

Circon HVAC Controllers

Circon Distributed Lighting Controllers

Circon Lighting Expansion Modules

Circon Intrusion Detection Controller

Circon Repeaters

Circon LON Integrated Node Connectors

Circon Heat Pump HVAC Controllers

Circon Site Management Controller with remote access and paging

Echelon Routers – 3 subnets

Leviton Lighting Occupancy Sensors

Computer Workstation programmed with Circon Visual Integrator software

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

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