

Project Profile

Cummins Engine Puts *Infinity* to the Test



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—Frank Clark
Director of Plant Engineering, FSP,
Cummins Engine Company

Cummins Engine Company is the leading worldwide designer and manufacturer of diesel engines ranging from 76 to 6,000 horsepower and the largest producer of diesel engines over 200 horsepower. Cummins' key markets are automotive, power generation, and industrial. The company also provides filtration systems and natural gas engines as well as engine components and electronic systems. Cummins' 1997 sales were \$5.6 billion and it employed 26,300 people.

In the mid 1980s, Andover Representative, Havel Brothers of Indianapolis, Indiana, installed an Andover Controls AC256 building automation system in Cummins' General Office Building and Parts Distribution Center in Columbus, Indiana. Cummins' facility staff were extremely happy with the system's performance so when a new control system for the company's Fuel System Plant (FSP) came up for bid in the early 90s, Cummins' facility staff voiced a strong preference to stay with the Andover Controls product line and Havel Brothers. As a result, Cummins selected what was then Andover's next generation product, *Infinity*, for installation in the FSP. Cummins, Havel Brothers, and Gary Kuzma of Heumuth, Obata & Kassabaum, Inc. (HOK), a Houston-based architectural engineering firm, collaborated to design and lay out the *Infinity* system, which utilizes the FSP's existing Ethernet TCP/IP network.

Precise Environmental Control

The environment in the FSP must be *precisely* controlled. The entire 480,000 square foot facility is air-conditioned year-round and the temperature in the general spaces must be constantly maintained at 72°F. $\pm 1.5^\circ$ so as to ensure a maximum 5 micron tolerance on all fuel systems measurements. Even closer tolerances must be adhered to in the labs. For example, in the FSP's state-of-the-art Dimensional Metrology Center, measurements are done to a maximum 1 micron tolerance and the temperature must be maintained at a constant 68°F. $\pm .5^\circ$ to allow for only the most *minute* expansion or contraction of fuel system components. The Andover *Infinity* system meets this precise temperature control challenge head-on.

And although controlling this environment may appear complicated on the surface, the facilities staff finds the *Infinity* system very user-friendly. Features such as HOA switches on the *Infinity* SCX 920 controllers make troubleshooting easy and *Infinity* DCX 250 touch screen displays mounted in every air handler room provide maintenance personnel and plant engineers access to all points on all AHUs from anywhere in the facility.

Beyond HVAC

HVAC control is just the beginning of *Infinity's* task list at Cummins. *Infinity* also controls and monitors the facility's wastewater treatment system. Previously, Cummins paid 44 cents per gallon to have an outside company treat their wastewater. Now with their own in-house system, *Infinity* monitors tank levels, views differential pressures, and enables

pumps, valves, solenoids, etc. By treating their own wastewater, Cummins now spends only 25 cents per gallon and anticipates a 13-month payback on their \$100,000 initial investment.

Infinity also controls and monitors a Reverse Osmosis (RO) system and a chemical treatment system. Both systems are important in treating the chilled water and conditioned water used in equipment cooling and the parts wash systems. *Infinity* monitors city water pressure, tank levels, differential pressure, etc., and also controls biocide and acid injection to maintain the correct PH and conductivity. And with *Infinity*, the manufacturing lines can monitor their total water consumption and track the cost of their utilities using *Infinity's* powerful reporting capabilities.

Infinity integrates to Cummins' Rapier Computerized Maintenance Management System (CMMS) via the SX 8000 front-end workstation and an Andover Controls *Plain English*® driver. The Rapier system keeps track of all equipment assets; i.e., service history, etc. The SX workstation forwards designated equipment alarms to the Rapier system, which in turn, creates any applicable work orders and pages the appropriate trade personnel to handle the problem.

According to Frank Clark, Director of Plant Engineering at the FSP, *Infinity's* ability to provide this "non-traditional" HVAC control was a major selling factor for Cummins. "There is so much versatility to this product," states Clark, "In addition to the standard controlling and/or monitoring of our chillers, boilers, AHUs, RTUs, cooling towers, VAV boxes, and boilers, we are using *Infinity* to do so much more—wastewater, chemical, RO treatment systems, etc. Because our systems are so unique here, we needed a versatile control system to manage them."

Chad Buchanan, Facility Engineer at FSP, agrees, "We wanted *one* system throughout the plant that not only would do basic facility management functions and conserve energy but could easily adapt to new applications. We've been on-line with *Infinity* for five years now and estimated savings for all plant operations is more than \$350,000 a year."

Future Plans

Havel Brothers says Cummins has several new control projects scheduled for the near future. Plans call for *Infinity* to control and monitor additional AHUs; load demand on three new air compressors (1-400 HP and 2-250HP Ingersoll Rands), operating them at optimal efficiency; and lighting, boilers, and numerous gage labs.

Plans also call for *Infinity* to provide air curtain control in the shipping and receiving areas. *Infinity* will control the flow of a powerful wall of air that will prevent the infiltration of unconditioned outside air into the building when the large overhead doors are open for pick-ups and deliveries.

In order to aid Cummins in their Demand Side Management Program of electrical energy, Havel Brothers and *Infinity* will be providing a lighting control system with an estimated savings of \$60,000.00 per year.

PROJECT AT A GLANCE:

Project Type:
HVAC

Project Name:
Cummins Engine Company, Fuel Systems Plant

Location:
Columbus, Indiana

Market Segment:
Manufacturing

Total Area:
480,000 sq. ft (44,592m²)

Infinity Equipment Installed:
3 - CX 9200 network controllers
2 - SX 8000 workstations
7 - DCX 250
32- SCX 920s
1 - LCX 810
74 -TCX 850s
26- TCX 851s
1 - TCX 870
6 - IOU boards

Network:
Ethernet TCP/IP over existing
Cummins network

Applications:
Temperature and humidity control
Wastewater treatment system
RO water system
Lighting control
Material handling system
Alpha paging system
Chemical treatment system
Metrology lab environmental control

Third-party Equipment and/or Drivers:
Maintenance management integration

Total System Points:
1838

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