

ROCKWELL COLLINS

TED KRAUSMAN
MECHANICAL ENGINEERING, UNIVERSITY OF IOWA



COMPANY BACKGROUND



CEDAR RAPIDS

Rockwell Collins is a public company that provides communication and aviation electronics solutions for commercial and government systems. Headquartered in Cedar Rapids, Iowa; the company employs 20,000 individuals worldwide. In 2009, the company's annual sales totaled approximately \$4.7 billion.

PROJECT BACKGROUND

Thermal imaging was used to identify various cost savings opportunities due to escaping heat or chilled air at the Rockwell Collins C Avenue campus. Other energy conservation measures such as optimizing the compressed air system, installing a solar collector and adding economizers to primary boilers were also investigated.

INCENTIVES TO CHANGE

Currently, Rockwell Collins is implementing energy conservation measures in order to decrease its carbon footprint and increase its level of environmental responsibility. The company participated in the Pollution Prevention Intern Program to identify opportunities to reduce energy costs at the C Avenue campus.

RESULTS

Exterior Insulation Finishing System: Thermal imaging of Building 109 showed significant thermal bridging, which indicates heat transfer through the building shell dominated by heat flow through the metal components. An exterior insulation would mitigate thermal bridging and reduce air exfiltration and infiltration. Due to the significant installation cost, this option should be further researched before implementation.

Unit Heater Maintenance Program: Unit heaters of various sizes are used to heat dock and tunnel areas on the C Avenue campus. Using thermal imaging, 14 of 24 unit heaters were found to be receiving hot water and radiating significant amounts of heat during the cooling season. A maintenance plan will ensure that the heaters are kept on during the heating season and turned off during the cooling season.

Compressed Air Leak Detection and Repair: Compressed air is utilized heavily in the fabrication and plating shops. An ultrasonic leak detector was used to locate and quantify air leaks in Building 105, which is estimated to use one-third of the compressed air on the C Avenue campus. The intern recorded the location and size of each leak to prioritize and track repairs.

Compressed Air Monitoring System: Compressed air is utilized across the Rockwell Collins C Avenue campus at variable rates throughout the year. Two main air compressor units operate at variable loads, depending on the fluctuating demand. A compressed air control system that will monitor demand and adjust compressor loading accordingly will improve efficiency of the compressed air system.

Transpired Solar Collector System on B110: Building 110 houses a circuit board fabrication center that requires 100 percent outside air and a high exhaust rate. The exhaust

rate creates negative air pressure in the building, which is connected to another building by an unconditioned walking tunnel. Negative air pressure caused by the high exhaust rate draws conditioned air through the tunnel into Building 110 and exhausts it outside. Using a solar collector wall system would allow Building 110 to be pressurized effectively, reducing the amount of conditioned air pulled from the adjacent building and reducing associated utility costs.

Boiler Economizers: Of the three primary boilers on the Rockwell Collins C Avenue campus, one is utilized year round while another is utilized only during the heating season. The intern recommended that exhaust stack economizers be

installed on two of the boilers to recover heat from the high temperature exhaust.

Decommission Steam Boiler: A steam boiler located in the mechanical room of Building 105 was being utilized at approximately 14 percent capacity during the summer. It is recommended that the steam boiler be decommissioned and replaced with point-of-use steam units.

CONVENTIONAL AIR POLLUTANTS AND GREEN HOUSE GASES DIVERTED IN STANDARD TONS					
Total for all sectors					
CO ₂	SO ₂	CH ₄	N ₂ O	CFC	PM-10
519.41	2.46	231.17	0.26	6.42	0.09



PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
EXTERIOR INSULATION FINISHING SYSTEM	\$26,497	26,500 THERMS	MORE RESEARCH NEEDED
UNIT HEATER MAINTENANCE PROGRAM	\$44,146	45,906 THERMS	RECOMMENDED
COMPRESSED AIR LEAK DETECTION AND REPAIR	\$18,599	295,091 KWH	RECOMMENDED
COMPRESSED AIR MONITORING SYSTEM	\$16,699	265,060 KWH	RECOMMENDED
TRANSPIRED SOLAR COLLECTOR SYSTEM	\$28,979	30,990 THERMS	RECOMMENDED
BOILER ECONOMIZERS	\$32,406	30,786 THERMS	RECOMMENDED
DECOMMISSION STEAM BOILER	\$10,560	9,500 THERMS	RECOMMENDED

