

# ROCKWELL COLLINS



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## COMPANY BACKGROUND

Rockwell Collins is a pioneer in the development and deployment of innovative communication and aviation electronic solutions for both commercial and government applications. The company has placed its mark on nearly every major aviation success of the last 75 years. The company's expertise in flight deck avionics, cabin electronics, mission communications, information management, simulation and training is delivered by nearly 20,000 employees, and a global service and support network that crosses 27 countries.

## PROJECT BACKGROUND

The 2011 intern evaluated Building 105, located at the Rockwell Collins C Avenue Complex in Cedar Rapids, Iowa. The goal of the evaluation was to determine the current condition of the heating, ventilation and air conditioning (HVAC) system in the aging facility. Once comprised entirely of machining space, Building 105 has undergone a number of renovations since its construction in 1958. As a result, the HVAC system no longer matches its service area. Additionally, adjacent office and machining spaces result in temperature/pressure gradients within the building envelope. Establishing a baseline of efficiency for Building 105's air handling system would allow Rockwell Collins to evaluate efficiency overtime and identify potential maintenance issues prior to costly machine failures.

## INCENTIVES TO CHANGE

Rockwell Collins has a relentless focus on continuous improvement that has spawned environmental savings projects as the company recognizes and works to reduce its carbon footprint. In recent years, the company has developed its environmental program to include a department devoted solely to environmental awareness. The Global Sustainability team evaluates and helps with projects that support environmental stewardship. The team's goal is to cut CO<sub>2</sub> emissions by 3 percent annually over a five-year period. This is the company's fifth year of participation in the Pollution Prevention Intern Program.

## RESULTS

Evaluation of the Building 105 HVAC system resulted in three major cost savings recommendations and one project deemed cost-prohibitive. These projects include variable frequency drive (VFD) installation, air handler replacement, air handler coil replacement, and space destratification.

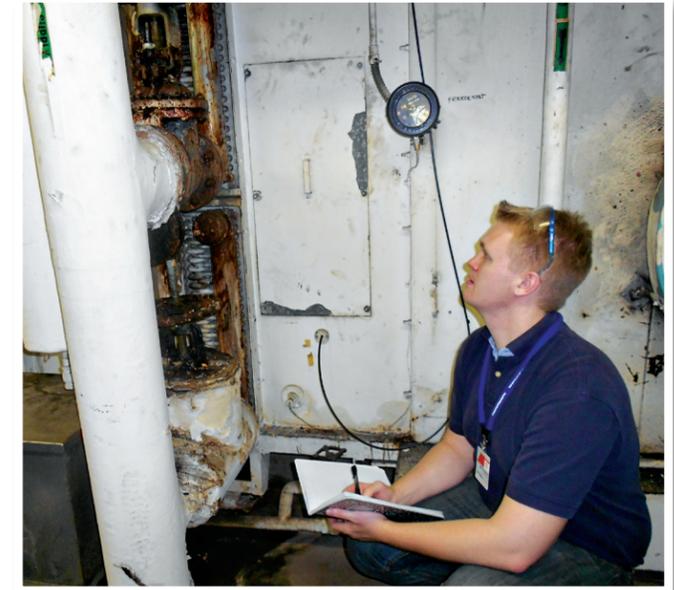
Variable control drives offer a wide range of operational benefits in addition to paying for themselves in energy rebates. Currently, the Building 105 air handlers use standard motors operating at constant rotational velocity. With VFD, the motor rotation could be modulated, allowing for soft-starts and air handler setbacks during nights and weekends.



At 80 percent load, the recommended drives would provide an approximate 50 percent greater energy savings than the current motor arrangement, with a simple payback of approximately 1.5 years.

Due to equipment age, some units may benefit more from a full replacement of the air handlers. New units could offer many benefits, including decreased maintenance, increased insulation, variable air volume controls, and increased air quality controls. Installing new coils alone would be too costly an investment in the current air handling units and would do very little in the way of increasing the overall building efficiency. Full unit replacement, however, would bring the Building 105 HVAC system up-to-date and provide building operators with a wider range of control options with which to maintain building air conditions.

The fourth project identified during the Building 105 HVAC evaluation involved air destratification. Using temperature probes, the intern evaluated the stratification of the Building 105 machining areas to determine if the air at the ground level was hotter or cooler than the air at the ceiling level. On average, a 5° F temperature difference was observed. At one point, the air at the ceiling level was 10° F above the air at the floor level. During winter months, the heat loss through the building envelope can be significant. Destratification would force the rising warm air back down to user level, reducing the overall strain on the HVAC system and increasing worker comfort. Early research suggests a three- to five-year payback period for a destratification project.



## CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS

Total for all sectors					
CO <sub>2</sub>	SO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CFC	PM-10
1134.11	5.84	36.92	0.051	13.26	0.13

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
VARIABLE CONTROL DRIVE INSTALLATION	\$29,224	449,605 KWH	RECOMMENDED
AIR HANDLER FULL REPLACEMENT	\$48,334	743,613 KWH	RECOMMENDED
AIR HANDLER COIL REPLACEMENT	\$16,406	252,434 KWH	NOT RECOMMENDED
MACHINING AREA DESTRATIFICATION	\$4,227	65,031 KWH	SEASONAL REVIEW RECOMMENDED
IN-HOUSE HVAC TOOL DEVELOPMENT	\$3,000	NONE	IMPLEMENTED

