

**PERFORMANCE CONTRACTING AT
THE UNIVERSITY OF CENTRAL OKLAHOMA**

**Robert H. Nall
Assistant Vice President, Facilities
University of Central Oklahoma**

ABSTRACT

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The University of Central Oklahoma and Johnson Controls, Inc. (JCI) entered into a Performance Contracting partnership in 2001 to resolve long standing facilities problems. Two buildings had gone through the summer without air conditioning capability, the central plant was not operating efficiently or reliably, the HVAC staff was not capable of providing necessary maintenance and repair activities, and there was insufficient funding to handle the emergency needs of the University. With JCI's help, projects costing approximately \$8.9 million were undertaken to replace the central plant's main chillers, connect the two buildings without HVAC capability to the central plant loop, replace the boiler systems in two buildings and a host of other HVAC upgrades and modernizations. That phase was so successful that JCI and UCO entered into an agreement for phase II of projects for another \$1.8M. Major improvements have been made in the condition of the campus infrastructure which will be paid for with the guaranteed utility savings to be accrued from the projects accomplished. Emergency conditions have disappeared and customer satisfaction with facilities conditions is as high as it has ever been.

INTRODUCTION OF THE ORGANIZATION

The University of Central Oklahoma (UCO), the state's oldest institution of higher education, was mandated by the Oklahoma Territorial Legislature on December 20, 1890, as the Territorial Normal School in Edmond. The original purpose of the school was to train teachers.

In 1919, the institution's name was changed to Central State Teachers College and the training program expanded to offer a four-year bachelor's degree in education. Two decades later, Central State Teachers College became Central State College and was authorized to grant both Bachelor of Arts and Bachelor of Science degrees. On March 11, 1941, Central State became part of a coordinated state system of post-secondary education overseen by the Oklahoma Regents for Higher Education, and joined institutions with similar missions as a "regional institution".

On July 1, 1991, Oklahoma lawmakers gave the institution its current name – the University of Central Oklahoma, which more appropriately represents the school's status as the third largest university in the state and its unique role in providing service to the people of central Oklahoma.

Today approximately 400 full-time faculty and 255 adjunct faculty teach more than 15,000 students enrolled in six undergraduate colleges and an office of graduate studies and research. UCO is now a master's degree granting institution, has students

from all 77 counties in Oklahoma, 46 states and 104 foreign countries. The campus consists of approximately 45 buildings and 1.6 million square feet on 206 acres.

The facilities on campus range from the first building, Old North, completed in 1893, to the most recent, the Wellness Center, completed in 2003.

STATEMENT OF THE PROBLEM/INITIATIVE

In 2001 the University found itself in an untenable situation regarding its facilities as evidenced by the following conditions:

- Heating/Ventilation and Air Conditioning (HVAC) systems in two buildings had completely failed
- University was involved in litigation with a contractor regarding previous HVAC projects
- Central plant was functioning only marginally and unreliably
- HVAC staff was incapable of handling the normal maintenance issues in a timely and reliable manner
- Building environment was #1 complaint
- All available capital funds had been committed to other long term projects
- Insufficient funding to keep up with deferred maintenance issues

DESIGN

Under the guidance of Mr. Steve Kreidler, Vice President of Administration, the University issued a Request for Proposals with the intent of entering into a Performance Contracting arrangement with a vendor to correct the major infrastructure problems in a comprehensive and timely manner. The strategy was to pay for the projects to be completed with proceeds from state bonds to be issued, with the bonds to be paid off with savings to be accrued from future utilities and operations and maintenance costs reductions. The University had heard of projects completed through Performance Contracting, but not with this scope and the associated emergency conditions that existed at UCO.

After extensive review of the proposals received and interviews of potential vendors, UCO decided to partner with Johnson Controls Inc. and a contract was signed. The first step involved determining the emergency actions needed to restore HVAC services to the two buildings whose systems had failed. JCI took emergency action to begin replacing the two primary chillers in the central plant, connecting the systems of the two failed buildings to the central plant loop and replacing another building's hot water boiler system even before the bond funds became available. Meanwhile, a comprehensive facilities audit was initiated by JCI with UCO personnel to identify other candidate projects that would pay for themselves within an established timeframe and reduce future utility costs. The Director of Physical Plant, the Director of Architectural and Engineering Services and the Director of Environmental Health and Safety served as the coordinating team to select the candidate projects based upon total available funds, project priorities and anticipated payback. The projects included not only the emergency

repairs, but numerous retrofits of lighting, plumbing and HVAC controls systems which would increase creature comfort, while providing reduced energy consumption.

Attachment One shows the types of projects that were selected for accomplishment. It should be noted that not all the projects would have satisfactory individual paybacks, but taken in aggregate, the plan seemed viable. Many system renovations and enhancements were to be accomplished but were to be paid for by the savings generated from other projects. JCI also performed an audit of previous utility bills.

IMPLEMENTATION

Once funding was available and all projects selected and approved, JCI began work on the balance of projects based upon a schedule that would cause the least, if any, disruption to faculty, students and staff. UCO made progress payments to JCI as with any normal construction or renovation project. JCI's audit of previous utility bills also revealed that UCO had been overcharged in some areas. With their involvement, the utility companies agreed to repay UCO over \$130,000. JCI was also instrumental in renegotiating the future electric rates for UCO. As a result of the project that would make the old thermal energy storage tank work properly, UCO could reduce its electrical demand during peak periods, thereby saving money, plus reducing the demand on the utility.

Based on their past history, UCO also had serious doubts the existing staff was capable of handling future operations, maintenance and repair requirements of the new

systems. UCO decided to outsource all HVAC system operations, maintenance and repair activities to JCI as part of the Performance Contracting effort. Fourteen employees were terminated with the guarantee from JCI that they could provide all operations, maintenance and repair activities at a guaranteed savings of over \$200,000 annually. The transition went smoothly and JCI has performed flawlessly for over 15 months. There have been no serious outages that can be attributed to failures of the JCI staff or the new equipment.

When the first phase of the contract was completed, the university had spent approximately \$8.9M and expected to pay for the bonds over 20 years. After Phase I was completed, additional candidate projects were reviewed and selected for Phase II, which is almost complete for a value of \$1.8M.

JCI is currently reviewing the campus situation to determine if there are other projects that can be accomplished as Phase III. If justifiable projects with acceptable paybacks can be identified, the University will consider proceeding with them for additional savings and improvement of the campus infrastructure.

BENEFITS

UCO now has reliable HVAC systems, improved lighting, plumbing and HVAC controls systems, and will soon have two new roofs to support its mission. Average

annual utility costs have been reduced from \$1.56 per sq ft to \$1.18 per sq ft or a reduction of 24%. In addition, the university will enjoy the reduced utility costs long after the bonds are paid off, and will be able to invest more of those savings into other university needs.

UCO's public image has dramatically improved as a result of this partnership. Students no longer call the media to complain about lack of heating and cooling, and faculty are not dismissing classes due to unbearable conditions. Customer complaints are now almost non-existent and positive responses are received from customer surveys concerning building environments. Customer satisfaction has improved as a result of faster service call response, enhanced reliability of systems and improved workmanship, as well as personnel relationships. In addition, facilities management staff now spends more time on other subjects instead of constantly fighting the previous HVAC nightmare.

From the environmental viewpoint, the energy conservation measures that were employed will result in the following by the year 2024:

- Natural gas reduction that will avoid the production of 272 tons of greenhouse gasses.
- Electrical reductions that will avoid the production of 9,924 tons of CO₂. This is the equivalent of not burning 4,465 tons of coal, or 27,800 gallons of gasoline.
- Water consumption will be reduced by 400 millions gallons

In summary, UCO received numerous infrastructure improvement projects valued at almost \$11M with little outlay of cash, and will have guaranteed utility cost savings

and operations and maintenance savings to pay back the bonds over a period of 20 years. That's quite a difference from four years ago when emergency conditions existed and there was no solution on the horizon. The use of this innovative Performance Contracting concept and the partnership with JCI was truly a life-saving operation for UCO.

RETROSPECT

In retrospect, we only wish we had started earlier.

ATTACHMENT ONE
 EXAMPLES OF THE TYPES OF PERFORMANCE CONTRACTING PROJECTS ACCOMPLISHED AT UCO

PHASE I				
BUILDING	PROJECT	PROJECT COST	PAYBACK	ANNUAL SAVINGS
ART, THATCHER, & MURDAUGH	CONNECT TO CENTRAL PLANT	\$461,464	0	\$0
MUSIC	BOILER RETROFIT	\$64,902	26.67	\$2,434
CENTRAL PLANT	REHABILITATION	\$964,177	21.86	\$44,106
CENTRAL CAFETERIA	CHILLER REPLACEMENT	\$52,352	40.37	\$1,297
BUSINESS	LECTURE HALL DEHUMIDIFICATION	\$44,000	0	\$0
CENTRAL CAFETERIA	SYSTEMS RETROFIT	\$295,811	36.6	\$8,082
CAMPUS WIDE	LIGHTING RETROFIT	\$794,730	6.07	\$131,012
CAMPUS WIDE	PLUMBING RETROFIT	\$525,485	6.04	\$86,939
AHU UNITS	IMPROVEMENTS IN CONTROLS	\$467,449	4.17	\$112,215
THERMAL ENERGY STORAGE	RETROFIT AND ACTIVATE	\$275,890	14.25	\$19,356
CENTRAL PLANT	TOWER FREE COOLING	\$175,561	4.5	\$39,050
VARIOUS	BOILER REPLACEMENTS	\$155,191	15.33	\$10,124
HEATING PLANT	TOTAL RENOVATION	\$1,072,498	14.23	\$75,379
PHASE II				
COMMUNICATIONS	REPLACE PACKAGED HVAC UNITS	\$55,100	10.74	\$5,131
EDUCATION	DEMAND CONTROL VENTILATION	\$10,440	6.94	\$1,504
BUSINESS	DEMAND CONTROL VENTILATION	\$20,880	11.1	\$1,881
PHYSICAL PLANT	INSTALL EMCS FOR AHUS	\$43,500	10.77	\$4,040
MCS/COYNER	HVAC IMPROVEMENTS AND REPLACE ROOFS	\$1,045,900	29.06	\$35,986