

Owner's Guide to Understanding Methods and Terms of Performance Contracting

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ABSTRACT

Performance Contracting is a method of making improvements to a facility and using the savings produced by the improvements to pay for the work over a period of time, typically five to ten years. Energy Conservation Measures (ECMs) support the typical project. These ECMs may include a high efficiency lighting retrofit, computer controlled energy management, replacement of older inefficient heating and air conditioning equipment, heating and air conditioning systems redesign, among others. A Performance Guarantee assures that the annual savings will be achieved by making up the difference should a savings shortfall occur.

Three contracting methods are used by owners seeking a Performance Contract: Request for Qualifications (RFQ); Request for Proposal (RFP); Negotiation. The method of selection can greatly effect the success of the project.

Owners seeking to improve their facilities through Performance Contracting should carefully consider the impact of the contracting method they select as well as the reliability of the savings expected. These areas are explored in the following pages.

INTRODUCTION

Designed as a tool to help public and private institutions improve their facilities without budgeting new funds, some current procurement methods are creating risk for the building owner, reducing potential savings and limiting competition.

In the state of Texas, K-12 educational facilities have been authorized to use Performance Contracting for a number of years. Texas House Bill 3530

authorizes the use of Performance Contracting by state agencies. House Bill 1243 does the same for county and municipal governments. Senate Bill 726 allows higher education facilities to use Performance Contracting and to keep the savings produced.

Under existing legislation, two procurement methods are commonly seen: Request for Proposal (RFP) and Request for Qualifications (RFQ). Currently, the state Energy Performance Contracting Guidelines Committee is developing guidelines for Performance Contracting in Texas. Due out in February, the committee report is expected to recommend the Request for Qualifications method of contract procurement.

Whether the facility is public or private, knowledge of the contracting methods and the Performance Contracting process is vital to a successful project.

PERFORMANCE CONTRACTING DEFINED

Performance Contracting is a method of project funding using energy savings from utility expense reductions. Utility savings are realized through the installation of new, higher efficiency equipment and other energy conservation measures which pay for the project over the course of several years. These savings are guaranteed. If the owner does not save at least the guaranteed level of savings, the contractor will write the owner a check for the difference.

Performance Contracting presents a building owner, public and private K-12 schools, colleges and universities or government agencies the opportunity to implement the project now, and have use of the new equipment immediately. In successful projects, building occupants often benefit with improved comfort and productivity.

The Performance Contracting advantage is allowing equipment and installation costs to be paid with funds the owner would have normally spent on his utility bill had the Performance Contract not been implemented.

PROCUREMENT METHODS

Request for Qualifications

The Request for Qualifications (RFQ) is a three step process generally leading to a Performance Contract if the owner's financial goals are met. The purpose of the RFQ is to allow the owner to evaluate the respondents and choose the company best qualified to perform the work.

The first step is the issuing of an RFQ document by the owner. This document gives general directions to the interested energy services companies (ESCOs) concerning the owners goals for the contract. It also gives the ESCOs information about the facilities involved such as number of buildings, location and square footage. The RFQ document requests information required by the owner in selecting the most qualified respondent. This respondent information typically includes: an organizational chart for the owners project; resumes of key people who will be involved in the project; a project management plan; the method the ESCO will use to calculate energy savings; references of similar projects; information concerning any of the ESCOs contracts that have been canceled or non-appropriated; financial information about the ESCO. Bid bonds, payment and performance bonds and guarantee bonds should be required to protect the owner from loss should the ESCO withdraw or fail to deliver the promised results.

In step two, the owner selects an ESCO and an agreement is entered into authorizing the ESCO to proceed with a detailed audit of the owners facility. During the detailed audit, appropriate energy conservation measures are selected along with their cost and expected savings. A proposal is developed which includes a scope of work and financial details. If the results of the audit meet criteria set forth in the agreement (typically that the project will be self funding or produce a minimum amount of savings), the owner agrees to either enter into a Performance Contract with the ESCO or to compensate the ESCO for their detailed audit. If the results of the audit do not meet the criteria, the owner is not required to enter into the Performance Contract or to compensate the ESCO for the audit.

The third step of the RFQ process is negotiating the terms and conditions of the Performance Contract and finalizing the document.

Request for Proposal

The Request for Proposal contains all the elements of the Request for Qualifications, plus it requires a scope of work, cost of the project and the guaranteed savings figures.

Each interested company is required to commit its resources to the expensive and time consuming task of performing a detailed audit on a speculative basis.

Typically, the ESCO's are given only general directions as to the owner's goals. Each ESCO evaluates the project and presents a proposal which they feel represents the greatest value to the owner.

Once proposals are delivered, the owner must select the approach which appears to present the greatest advantage. The owner's staff may have limited experience in energy conservation projects and face a tough decision. One that they will have to live with for many years. The owner must evaluate the quality of the audit performed and the suitability of the ECMs proposed if accurate results are to be expected.

Negotiated

The negotiated approach to Performance Contracting usually applies only to private business or institutions which have no legal requirements for competitive bidding. The negotiated approach by its nature can take many forms. Generally, the negotiated approach will be very similar to the Request for Qualifications method in that an agreement is established in which the owner agrees to either enter into a Performance Contract or pay for the detailed audit if their financial goals are met by the resulting proposal.

ECONOMICS OF PERFORMANCE CONTRACTING

Types of Savings

Savings generated may take more than one form. A well designed and installed energy conservation project will generate utility bill savings, manpower savings and lower repair costs. Since the owner relies on the savings produced to meet the annual payments for the project, the savings upon which the project is based must be 100% verifiable.

Utility Bill Savings.

Utility bill savings are considered the most reliable since they may be verified with relative ease and be reallocated in the budget for debt service.

The first step in verifying utility bill savings is to establish a base year or baseline with which to compare post-retrofit years. No two years are exactly alike in terms of utility usage. Each month varies in two important ways, weather and occupancy. In order to calculate savings, a method of comparing the base year to the current year must be established. Without adjusting for weather and occupancy, a post-retrofit year with an abnormally cool summer or lighter than normal occupancy would show great electrical savings. A year with a hotter than normal summer or unusually high occupancy would show poor savings. Both would be in error.

The energy consumption baseline is a 12 calendar month period of the facility's pre building improvement energy consumption as identified in the baseline information. The baseline information includes utility, occupancy and other information which allow baseline energy consumption to be accurately compared to energy consumption in later years. The following describes a typical baseline development.

Utility bills do not usually align with calendar months. For example, a bill may have read dates of November 8, 1997 and December 9, 1997. Thus, the billing period is 31 days but it covers portions of two months. To match the energy usage with historical weather data, it is necessary to prorate the utility information to make it align with calendar months. A prorating algorithm is applied to the utility bills to align utility usage with calendar months.

To determine how energy consumption relates to weather, a special accounting program uses a linear regression to form monthly ratios which compare consumption to the heating (or cooling) degree days experienced during the calendar month. The degree days used in this ratio are not standard degree days (based on 65 degrees Fahrenheit). Instead, they are based on a break even temperature chosen to best model the energy source's weather-sensitive behavior.

The baseline contains two types of information about occupancy in the premises. The first figure is the total square feet of space believed to have been conditioned in the premises during the month. The

second figure is the number of hours the premises are believed to have been occupied during the month.

The savings calculation adjusts the baseline month to the current months weather and occupancy. The amount of savings realized is the difference in the adjusted baseline month and the current month's utility usage. It is a comparison of what the owner would have paid without the energy conservation improvements to what he paid with the improvements given the same weather and occupancy.

Operational Savings.

Operational savings, while valid in many cases, are difficult to accurately project. Operational savings are almost always listed in the guaranteed savings amount, which can be misleading. In reality, they are agreed upon in advance and not audited. Thus, they are not actually subject to the performance guarantee protection. Operational savings fall into five general categories: equipment replacement savings based on life cycle costing; repair cost savings; maintenance contract savings; in-house labor savings; productivity savings.

Many if not all of these savings will be realized by a well designed and installed Performance Contract. Caution should be used, however, in basing the project on savings that are calculated statistically.

For example, replacing older equipment will produce maintenance savings both in manpower and repair material. Repair material or outside service contractor costs are generally estimated on past history. If the equipment is replaced and not eliminated, some unknown level of maintenance and repair will still be required during the Performance Contract period.

In the case of manpower savings, unless the maintenance crew is to be reduced as a result of installing new equipment, no actual dollar savings will occur.

Productivity savings are difficult if not impossible to quantify and no budget line item exists to move to the Performance Contracting debt service column.

Service contracts for major equipment should be maintained whether the equipment is old or new. In many cases, minimum amounts of annual service are

required to maintain warranties. If the equipment is eliminated such as abandoning an old steam boiler in place, maintenance savings are legitimate.

A good test for operational savings: is it an existing budget line item that can be moved to the Performance Contracting column?

SAVINGS CALCULATION METHODS

Computer Modeling

Several computer modeling programs are available for modeling a buildings utility usage. Among these are Carrier E-20, Trane Trace, DOE-2 and BLAST. All of these programs require detailed building information to simulate building energy loads over a typical weather year.

Once a model is built, it's accuracy is tested against the buildings known actual energy usage. When sufficiently accurate, the effects of an ECM alone or in concert with other ECMs may be tested for utility savings as compared with the existing systems and operation. The positive side of computer modeling is its relative accuracy. The downside is it's cost in terms of dollars and manpower especially when multiple buildings are involved.

Calculation of Individual ECM Savings

Another method of calculating energy savings is to calculate the results of individual ECMs. This method is usually restricted to time scheduling savings or the calculation of savings derived from replacing older equipment with higher efficiency equipment although more ambitious calculations may be undertaken. The positive side of individual calculations is the moderate cost in terms of dollars and man-hours. The downside is accuracy when assumptions are made concerning equipment loading and building occupancy. Also, multiple ECMs may cause interaction which is not allowed for when performing individual calculations.

Targets

Another popular method for determining the savings potential of a project is the use of targets. Targets are generally represented by energy units such as kilowatt-hours per square foot or British thermal units per square foot which are either computer model generated or gathered from actual projects. In using the targets, the ESCO must modify them based on the geographic area of the studied job, the type of occupancy and the weather conditions of

the baseline year. The positive side of using targets is the relatively low cost of analysis and the limited amount of time required. The negative side is the relative accuracy of the method and the danger of viewing all facilities of similar occupancy as identical.

Average Percentages

A method sometimes seen, especially for budgetary work is the use of average percentages. In this method, experience with various types of occupancies is used to assign a potential savings. For example, an energy conservation project in a typical Texas public school may be expected to reduce utility bills from 17 to 25 percent. The positive side of this method is low cost. The downside is lack of accuracy and a tendency to see all similar occupancies as identical.

Load Factor Analysis

A buildings electrical load factor may be calculated as follows:

$$\frac{\text{Annual Kilo-Watt-Hours}}{(\text{Average Kilo-Watt Demand})(\text{Hours per year})}$$

A load factor of one(1) would indicate that the building ran continuously and had a constant load. Typically, a high load factor (closer to 1) indicates excessive equipment runtime.

If the load factor of high efficiency similar occupancies in similar geographic areas is known, a load factor target may be established. A utility model of the studied facility may then be modified until the target load factor is achieved. The savings will be equal to the amount of modification required to achieve the desired load factor in the model. The positive side of load factor analysis is its low cost and general accuracy. The downside is that surprises can occur if the studied building's utility profile is not thoroughly understood and that the method only applies to time scheduling ECMs.

Operational Savings

Operational savings are calculated in a number of ways. Annual equipment replacement cost savings are determined by the actual value of equipment divided by the typical economic life of the equipment. Optionally, the value of the mechanical equipment may be taken as a percentage of the original construction cost. Manpower savings are calculated using the hours avoided and the total of salary and benefits. Outside service calls or repair

materials may be estimated by averaging five years of invoices.

Extreme care should be used in calculating operational savings. Typically, these savings are stipulated in the contract. This means that they are agreed upon up front and do not have to be shown in the regular savings audits. Only items that are proven savings should be included as operational savings.

COMPARATIVE COST OF ANALYSIS

The cost of a detailed audit is substantial, often exceeding \$25,000 for a medium size public school system. The methods of savings calculation are shown in descending order of cost:

1. Computer Modeling
2. Calculation of Individual ECMs
3. Targets
4. Load Factor Analysis
5. Operational Savings
6. Average Percentages

Pressures Exerted by the RFP Method

As has been shown, the cost of energy analysis is substantial and the more accurate the analysis, the greater the cost. When a project is bid as a Request for Qualifications (RFQ) the ESCO does not have to gamble the high cost of energy analysis against multiple competitors. Only if the ESCO is selected, will he be required to conduct a detailed audit.

If the project is bid as a Request for Proposal (RFP), the ESCO is faced with spending an average of \$25,000 on a job that he may have only a 20% chance of securing.

Therefore, in an RFP environment the ESCO is presented with two choices if they are to be successful long term:

1. Decrease the cost and thus the accuracy of the audit.
2. Increase the closing ratio.

Decrease the Cost of the Audit

One response to the problem is to decrease the cost of the audit in an RFP situation. Since the ESCO is bound by a savings guarantee, he is

responsible for errors made in estimating energy savings. As previously shown, energy savings are the most costly to calculate accurately. To minimize this, the ESCO may turn to operational savings. As seen above, operational savings are among the least costly to audit of the savings calculation methods. Since operational savings are stipulated and not audited or guaranteed, the ESCO emphasizing operational savings must find enough of these savings to dilute any losses in actual utility bill savings caused by a cursory energy audit.

A second method of decreasing the cost of an audit is to present the "standard solution." Detailed audits are custom in nature. There is no fixed method that fits all facilities. Also, there is no fixed solution for every facility. While there is no fixed solution, there are some individual ECMs that will apply to most buildings. Among these are lighting retrofits and time scheduling. These two ECMs also produce savings that are relatively inexpensive to calculate. By applying only the "standard solution" to all audited buildings, the cost of the audit is reduced. Unfortunately, the "standard solution" may sometimes prove to be the wrong solution, causing reduced comfort or inappropriate light levels.

While relying on operational savings or on a "standard solution" reduces the one time cost of the audit, they may also exclude other measures that may have been found in a detailed audit. It is true that the owner may save on the one time audit cost, but they lose the additional savings that could benefit them annually for years to come.

Increase the Closing Ratio

The alternative to reducing the cost of the audit in an RFP environment is to increase the closing ratio. Increasing the ratio of jobs bid to jobs closed from 20% to 70% or greater, allows the ESCO to provide a quality detailed audit and still be profitable in the RFP environment. A method often used to increase the closing ratio is to be very selective about jobs bid. This selectivity may limit the competition for the owners project.

WHAT IS BEST FOR THE CUSTOMER?

Savings Calculations

Any of a number of techniques may be used to estimate savings. The important factors are accuracy and verifiability. The owner must not be placed in the situation of not having adequate real savings dollars at the end of the year. It is recommended that

the bulk of the savings guarantee be in actual energy bill savings. Operational savings should be carefully considered and taken advantage of if they can be shown to be solid. Further, the owner should receive regular savings reports that are easily understood. Even though operational savings are not a part of the regular savings reports and not subject to the savings guarantee, the owner should independently audit these savings periodically to be certain that they are not being absorbed without providing real savings.

Procurement Method

The Request for Qualifications (RFQ) process is believed to be the owner's best choice. This method allows for greater competition, improves communication and helps assure the owner of a quality project.

By selecting the ESCO that the owner feels will be most qualified to do their work before conducting a detailed audit, the owner and contractor can work as a team in determining which ECMs and financing methods best meet the owner's objectives. Assuming a quality audit is conducted, the cost to the owner is the same whether an RFP or an RFQ is used.

THE IMPORTANCE OF MONITORING TO A SUCCESSFUL PROJECT

Experience has shown that in many cases whether energy conservation takes the form of a seven day time clock or an extensive computerized energy management system, the energy efficiency of the facility often returns to its original level over time. This occurs when technicians by-pass problems rather than fix them or when changes are made in an effort to quickly resolve occupant complaints, among other causes.

For the energy conservation project to remain successful for many years, remote monitoring and tuning or active owner involvement is needed. The ESCO's ability to remotely interrogate the system is also helpful in training the owner's staff and in troubleshooting problems.

Costly maintenance contracts on computerized energy management systems are unnecessary if:

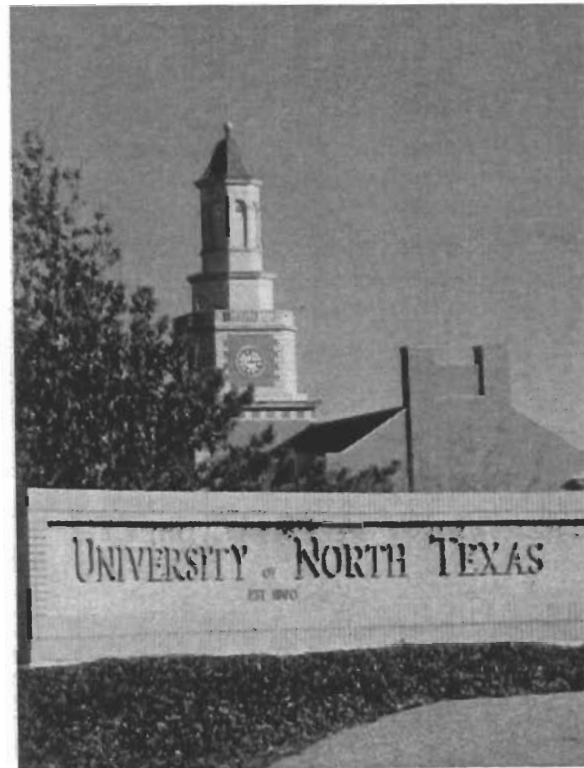
- the training given the owner is of good quality
- the system is not so complex that the owner can't maintain it adequately

CASE STUDY: THE UNIVERSITY OF NORTH TEXAS AT DENTON

Existing Conditions

Campus Description.

The University of North Texas is a major four-year state supported institution of higher learning with an enrollment of approximately 25,000 students. Fifty-four significant buildings and several warehouse and service facilities make up the main campus in Denton, Texas. These buildings include facilities for the liberal arts, sciences, fine arts, student housing and dining, administration, intramural athletics, and maintenance and service. All buildings are low-rise construction of from one to five floors with masonry or gypsum interior surfaces. Most roofs utilize built-up roofing, although some metal roofs are in place.



University of North Texas in Denton, Texas

Utilities.

Electrical service enters the campus at 13.2 kV at two substations. For the local utilities billing purposes, electrical consumption and demand is metered at these two locations. Demand is measured in units of kVA. Power is distributed to the campus at the primary voltage on the University's own

distribution grid and is stepped-down to either 208, 240, 460 or 480 volts at each building. The University sub-meters electricity at each building to allow for proper allocation of electrical costs to the appropriate accounts.

Each building which utilizes natural gas is metered individually at the building. The local utility assimilates all metered consumption into a single monthly invoice, with the building meter data used for internal accounting. Natural gas is provided by the Texas Land Office and is transported to the University by the local utility.

HVAC Systems.

Forced-air, four-pipe heating and air conditioning systems are used for comfort conditioning in almost all facilities. The preponderance of air systems are multi-zone and double duct. The nature of these mixing systems contributes a great deal to the excessive energy consumption which was identified during the energy audit. Most cooling is provided by chilled water generated by electrically-driven vapor compression refrigeration machines, most of which are water cooled. Heating is typically provided by hot water, derived from natural gas fired steam boilers with heat exchangers to convert the steam into hot water.

There are three central plants on campus which serve multiple buildings. These are:

- Power Plant, consisting of three chillers of 2,920 tons total capacity with a primary-secondary - tertiary pumping system, and two high-pressure steam boilers with dual heat exchangers with a primary-secondary pumping system.
- Wooten Hall Plant, consisting of two chillers of 702 tons total capacity with a primary-secondary-tertiary pumping system and two steam boilers with dual heat exchangers with a primary-secondary pumping system.
- PE Building Plant, consisting of three chillers of 558 tons total capacity and two steam boilers with dual heat exchangers, both with primary only water distribution.

All other buildings are served by their own local central plant or packaged HVAC equipment.

Temperature Controls.

Pneumatic temperature controls have been the system of choice at the University throughout its history. Only two buildings have been renovated to

complete direct digital control systems. Other buildings have had partial retrofits. Direct digital controls are specified in new buildings which are currently planned or under construction. Analysis of repair records and purchase orders for items such as pneumatic thermostats indicated that the maintenance needs of these systems left the maintenance staff in a constant "catch-up" mode.

Energy Management.

The remnants of a first generation energy management system (EMS) are still in place at UNT. It is the only EMS in use for five major facilities on the campus. Two other modern systems have been installed since 1990. With a few exceptions, these new systems replaced the original system on a point-for-point basis. Reliability and ease of use increased, but system capabilities were only marginally improved. One of the newer systems is in place in approximately twenty-three buildings. The other is installed in five buildings. All of the systems are monitored from the campus Automated Energy Management System office. A full time technician, employed by the University, maintains and operates these systems.

Lighting.

Fluorescent lighting is dominant in all University buildings. Most fixtures utilize 4-foot T12 lamps with an extra-cool Daylight color. This particular lamp is poor in both energy efficiency and color rendering. Four lamp fixtures are the most common although there are numerous two lamp fixtures in use. Almost all of the fluorescent fixtures use magnetic ballasts, some of which have been upgraded to a high-efficiency model. Incandescent lighting is used in several applications such as exit lights, wall accents, entry downlights, outdoor soffits and art spotlighting. HID lighting is used for most of the sports oriented buildings and also for security lighting. A mixture of mercury and metal halide lamps are in place. Occupancy sensors have been installed in a few buildings to control lighting in the classrooms.

Goals For The Project

The Universities goal for the Performance Contract was to improve the learning environment by improving space conditioning and lighting systems. When discussing the goals of the project with Raymond E. McFarlane, P.E. - Director of Physical Plant and Planning & Construction at UNT, he said *"We want to spend our money on education, not utilities. Prior to current legislation, any utility*

savings generated were retained by the state. If utility bills went down, so did your appropriation. Now if utilities go down, the savings can be used to pay for projects like this."

According to Phil Diebel - Vice President for Finance and Business Affairs, "Assuming in a worst case that the combined utility bill and debt service for the project after construction is no larger than the current bill, then the decision to move forward with the project becomes a no-brainer."

Project Contracting Method

UNT chose to use a Request for Qualifications to select the Performance Contractor. McFarlane said "Requesting full blown proposals would have been nice from a selfish standpoint, however, realistically we were not comfortable with saddling contractors with the large expense of responding to an RFP when only one contractor would end up getting the project". Jim Pack - UNT-Building and Utilities Maintenance Manager agreed. "We felt like it would not be fair to ask companies to come in spend tens of thousands of dollars putting together a proposal of this magnitude and then not do business with them". The UNT staff felt comfortable with the RFQ process. McFarlane added "RFQ responses were detailed and included the types and amount of information that allowed us to make an educated decision on the best firm for this project"

UNT hired a third party engineer to assist in the evaluation of all proposals submitted. By selecting one contractor to come on campus and help develop the project and complete the audit, the UNT staff was able to focus completely on one company. This enabled both parties to communicate freely and openly about the desires of the University, the desires of the contractor and what would ultimately be a win-win situation for all parties involved. On a project of this magnitude, it would be virtually impossible to have the open communication needed to make the project a success if more than one company had been involved at this stage.

Detailed Audit Phase

The UNT detailed audit presented a number of challenges. Among these were organizing the massive data gathering effort and choosing the method of savings calculation.

A ten member team was assigned the job of performing the audit. The audit included 40 buildings with a gross area of 2,617,606 square feet.

The approach to energy calculations for the University of North Texas incorporated the principles discussed in Chapter 28 of ASHRAE's 1985 Fundamentals Handbook. A method was required which would allow for the analysis of multiple ECMs on complex HVAC systems without the time and expense of detailed simulations. A simplified multiple measure approach was selected to best meet these requirements. This approach uses ASHRAE's recommended 3 - step process of: (1) calculating space loads, (2) calculating secondary equipment loads and energy use, and (3) calculating primary equipment energy requirements.

The detailed audit phase of the project lasted six months and required more than 5000 man-hours to complete. A summary of the results of the audit follows.

Summary of Project University of North Texas

Category	Savings	Units
kWH Savings:	23,200,900	kWH/yr.
Demand Savings:	66,042	kVA/yr.
Gas Savings:	61,477	MCF/yr.
Btu Savings (Source):	332,452	MMBtu/yr.
Btu Savings (Site)	142,506	MMBtu/yr.
Cost Savings:	\$1,405,051	\$/yr.
Base Year Cost Reduction:	30.9	%
Implementation Cost:	\$9,045,454	\$
Simple Payback:	6.4	Years

Energy Conservation Measures.

The following energy conservation measures were selected for UNT:

- Unified campus wide computerized energy management system
- Direct digital control of air handlers
- Lighting efficiency improvements
- Lighting control for the Library
- Add variable frequency drives to existing vav air handling systems

- Variable flow pumping
- Variable speed drive control of cooling tower fans
- Selected high efficiency chiller replacement
- Selected high efficiency motor replacement
- Power factor correction
- Selected high efficiency packaged equipment replacement
- Central plant optimization
- Selected boiler replacement



New 1200 ton chiller at the UNT power plant

Contract Negotiation Phase

The terms and conditions of the contract were negotiated. The contract and the technical proposal were reviewed by the State Energy Conservation Office (SECO). UNT also hired a third party engineer to review the technical proposal.

Performance Contracts for Higher Education require approval by the Texas Higher Education Coordinating Board. The financing for Higher Education Performance Contracts require approval by the Texas Bond Review Board.

Installation Phase

The installation phase of the UNT project began in July of 1997 and is scheduled to complete in February of 1999. The project is utilizing four major subcontractor categories: mechanical; electrical;

lighting installation; and power factor correction. The ESCO is providing project management, engineering, energy management systems, lighting retrofit materials, documentation, systems commissioning, owner training, warranty, remote monitoring and the performance guarantee.

The project schedule is built using Microsoft Project software. The project schedule allows the management team to view current status, problem areas and the long term impact of delays on all areas of the project.

UNT operators will be trained in two phases for system operation. First, on-site using their own equipment, followed by factory training.

On-site, the operators will learn about their system's architecture, basic system operation and troubleshooting.

The factory training is to include:

- HVAC Concepts
- Control Concepts
- Energy Management Architecture
- System Operation
- System Troubleshooting

Following the two phases of training, remote monitoring will be provided to assist the operators with any problems they may encounter throughout the guarantee period.

Follow-Up

At the close of the installation phase, the project will be monitored by the ESCO for the duration of the 10 year guarantee period. Regular savings reports will be provided to aid the University in tracking the progress of their guaranteed savings. The ESCO will also assist the University with operational questions and energy management repair.

This continuing support is intended to maximize the performance of the project and to identify areas of greater savings throughout the guarantee period.

SUMMARY

Many facilities both public and private have infrastructure problems that are sometimes difficult to solve within existing budgets.

Performance Contracting is a method of solving these problems with no new money required. With a basic understanding of the processes and contracting

methods, the owner's staff can successfully implement a Performance Contract.

Two concepts should guide the owner through the selection process:

1. Select the contracting method most likely to yield a quality contractor and project.
2. Exercise caution in accepting savings estimates that may not produce quantifiable results.

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