Contract Provisions for Enhanced Operations-and-Maintenance Services[1]

Introduction

Frequently, owners and managers out-source most if not all the operations and maintenance (O&M) services for their building systems. Approximately 40% of all non-residential buildings contract maintenance service for their heating, ventilating and air conditioning (HVAC) equipment. Even large national companies and institutions with their own building (O&M) staff often use outside service contractors to supplement their work.

Several factors contribute to growing business opportunities for service providers in operating and maintaining retail and office buildings. These include:

- Indoor Air Quality Issues
- Americans With Disabilities Act
- Phase-Out Of CFC Refrigerants
- Building Owners'/Managers' Desire To Reduce Operating Costs And Assure Reliability
- Building Owners'/Managers' Desire To Be Environmentally Responsible

As third-party providers become more sophisticated in selling services, there is a need for building owners and managers to be more informed consumers of these services. Researching what a good O&M service contract should include and how to obtain one is often too confusing and time consuming for the typical owner or manager to pursue. This document provides information for commercial and retail building owners, facility managers, property managers and chief building engineers on obtaining best practice service contracts.

This document does not attempt to direct how the legal language of a service contract should be written. Instead, the purpose is to provide a guide to help owners and managers develop best practice service contracts. The main objectives are to identify:

- What Owners Need To Know To Obtain A Good Service Contract
- Ways To Evaluate The Service Provider
- Major Service Needs
- What The Contract Should Include
- What Can Be Done To Ensure The Contracted Services Are Obtained

The primary focus is on service contracts for heating, ventilating and air conditioning systems and equipment. The discussion is limited to contracts offered by those firms who locate service personnel off-site as opposed to the contracts offered by firms that provide maintenance management services and locate key building technical staff on-site.

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Definitions

What is Operation and Maintenance?

Building operation and maintenance (O&M) is the on-going process of sustaining the performance of building systems according to design intent, the owner or occupants' changing needs and optimum efficiency levels. The traditional O&M process involves a group of activities that help sustain a building's overall profitability by addressing tenant comfort, equipment reliability and efficient operation.

Efficient operation in the context of O&M refers to activities such as equipment scheduling and optimizing energy and comfort control strategies to allow equipment to operate only as much as needed to fulfill its intended function. Maintenance activities involve physically inspecting and caring for equipment. Together O&M tasks performed systematically, address reliability and reduce equipment degradation as well as sustain energy efficiency. Without sufficient and well trained in-house O&M staff, service contracts are often the only means an owner has of maintaining the building's mechanical systems in an organized and on-going manner.

What Are the Various Types of Service Contracts?

In the maintenance service industry, there is no standard or set definition for the various kinds of service contracts. Each mechanical or maintenance service contractor puts together a unique package of service contracts. The package often consists of three or four types of contracts, each presenting a different level of comprehensiveness.

For the purpose of this document we will define four fundamental types: the full-coverage, full-labor, preventive-maintenance and inspection contracts. We will also briefly discuss the end-use or end-results type contract, which is a newer concept in service contracting. The names are based on industry literature and discussions with professionals in the field. Within these contracts there can be many variations, depending on an owner's needs and the contractor's willingness to modify or customize their service offerings.

Most of the contract types discussed below may encompass the entire mechanical system or focus on just one piece of major equipment such as a chiller. Also, owners may have more than one type of contract in place at any given time.

Full-Coverage Service Contract

A full-coverage service contract provides 100% coverage of labor, parts and materials, as well as emergency service. Owners may purchase this type of contract for all of their building equipment or for only the most critical equipment, depending on their needs. This type of contract should always include comprehensive preventive maintenance activities for the covered equipment and systems.

If not already addressed by the contract, for an additional fee the owner can purchase repair and replacement coverage (sometimes called a "breakdown" insurance policy) for covered equipment. This makes the contractor completely responsible for the equipment. When repair and replacement coverage is part of the agreement, it is to the contractor's advantage to perform rigorous preventive maintenance according to schedule, since they are responsible for replacing the equipment if it fails prematurely.

This is usually the most comprehensive and the most expensive agreement regarding the short-term impact on the maintenance portion of the facilities budget. However, in the long term it may prove to be the most cost-effective, depending on the owner's overall O&M objectives. A major advantage for obtaining a full-coverage contract is the ease of budgeting and the fact that most if not all of the risk is carried by the contractor. However, if the contractor is not reputable or underestimates the condition of the equipment they are ensuring, they may do only enough preventive maintenance to keep the equipment barely running until the end of the contract period. Also, when a company underbids the work in order to win the contract, they may attempt to break the contract early if they foresee a high probability of one or more catastrophic failures occurring before the end of the contract.

Full-Labor Service Contract

A full-labor service contract covers 100% of the labor to repair, replace and maintain most mechanical equipment. The owner is required to purchase all equipment and parts. Although preventive maintenance and operation may be part of the agreement, actual installation of major plant equipment (such as a centrifugal chiller, boilers and large air compressors) is typically excluded from the contract. Risk and warrantee issues usually preclude allowing anyone but the manufacturer to install this type equipment. Also, how emergency calls are dealt with in this arrangement varies. The cost of emergency calls may be factored into the original contract or the contractor may agree to respond to an emergency within a set number of hours, with the owner paying separately for the emergency labor. Some preventive maintenance services are often included in the agreement along with minor materials such as belts, grease and filters.

This is the second most expensive contract regarding short-term impact on the maintenance budget. This type of contract is usually only advantageous for owners of very large buildings or multiple properties, allowing them to buy in bulk and therefore obtain equipment, parts and materials for much less than the average building owner. For owners of smaller-to-medium size buildings, cost control and budgeting becomes more complicated with this type of contract, since labor is the only constant. Because they are only responsible for providing labor, the contractor's risk is less with this type contract than a full-coverage contract.

Preventive-Maintenance Service Contract

The preventive-maintenance contract is generally purchased for a fixed fee and includes a number of scheduled and rigorous preventive-maintenance activities such as changing belts, filters, cleaning indoor and outdoor coils, lubricating motors and bearings, cleaning and maintaining cooling towers, testing control functions and calibration, painting for corrosion control, etc. Generally, the contractor provides the materials such as filters, belts, grease, paint and coil cleaner as part of the contract. This type contract is popular with owners and is widely sold. The contract may or may not include any arrangements regarding repairs or emergency calls

The main advantage of this type of contract is that it is initially less expensive than either the full-service or full-labor contract and provides the owner with an agreement that focuses on quality preventive maintenance. However, budgeting and cost control regarding emergencies, repairs and replacements is more difficult since these activities are often done on a time and material basis. With this type contract the owner takes on most of the risk. Also, unless the owner knows what PM activities are most important and how often the activities should be performed (given the equipment condition and the surrounding environment), they could end up with a contract that addresses substantially more or less than what they really need. For example, if the building is in a particularly dirty environment, the outdoor cooling coils may need to be cleaned two or three times during the cooling season instead of just once at the beginning of the season. It is important to understand how much preventive maintenance is enough to realize the full benefit of the contract.

The owner or manager needs to beware that some contractors' preventive maintenance programs more closely resemble the inspection service contract described below. Not all PM service contracts contain the same rigor. When obtaining bids, compare the level of service each agreement intends on providing, as well as the price.

Inspection Service Contract

An inspection contract, also known in the industry as a "fly-by" contract, is purchased by the owner for a fixed annual fee and includes a fixed number of periodic inspection-type activities. Inspection activities are much less rigorous than preventive maintenance. Simple tasks such as changing a dirty filter or replacing a broken belt are performed automatically, but for the most part, inspection means looking to see if anything is broken or is about to break and reporting it to the owner. The contract may or may not include a limited amount of materials (belts, grease, filters, etc.) be provided by the contractor or any agreement regarding other service or emergency calls.

In the short-term perspective, this is the least expensive type of contract. This may also be the least effective type contract, since it is not always a moneymaker for the contractor, but is viewed as a way to maintain a relationship with their customer. With this "foot in the door" arrangement, the contractor is more likely to be called when a breakdown or emergency arises. They can then bill on a time-and-

material basis. Low cost is the main advantage to this type of contract and is thought to be most appropriate for smaller buildings with simple mechanical systems.

End-Results Contracting

End-results or end-use contracting is the newest concept in service contracting and is not yet widely available. With this type contract, the outside contractor takes over all of the operational risk for a particular end-result such as comfort. In this case, comfort is the product being bought and sold. The owner and contractor agree on a definition for comfort and a way to measure whether the results are achieved. Comfort may be defined as maintaining the space temperature throughout the building between 72^{o} to 74^{o}F for 95% of the annual occupied hours. The contract payment schedule is based on how well the contractor achieves the agreed upon objectives.

This type contract may be appropriate for owners who have sensitive customers or critical operational needs that depend on maintaining a certain level of comfort or environmental quality for optimum productivity. How risk is shared between the owner and contractor depends on what type or how many end-results are purchased. If comfort defined by dry-bulb temperature is the only end-result required, then the owner takes on the risk for ameliorating other problems such as indoor air quality, humidity and energy use issues. Maximum contract price is tied to the amount and complexity of the end-results purchased.

Who are the Providers

There are a variety of contractors offering maintenance service contracts to owners of commercial buildings and retail facilities:

- Mechanical Contractors and Full-Service Mechanical Contractors
- Maintenance Service Contractors
- National Maintenance Service Firms (Consolidators)
- Specialized Service Contractors
- Manufacturers
- Maintenance Management Firms

Mechanical Contractors

Mechanical contractors may install, repair and perform O&M on all types of mechanical equipment including controls. The firms known as full-service mechanical contractors also design systems as well as install and service systems. Both types of firms may also distribute manufacturers' HVAC equipment and control systems. Service contracts generally make up anywhere from 10% to 25% of their business.

Maintenance Service Contractors

Maintenance service contractors offer a broader range of services, such as janitorial, lighting maintenance, and preventive HVAC maintenance, including installation and repair of equipment. Their offerings may also include infrared scanning, ultrasonic testing and eddy current testing. These firms generally do not sell equipment. Service makes up the major share of their business. Primarily owners that outsource most, if not all, of their building services hire them. These firms may have HVAC technicians that are responsible for several different buildings. However, the janitorial crews are generally responsible for the same buildings. Profits for these firms generally depend on the number and size of the janitorial and maintenance service contracts they sell.

National Maintenance Service Firms

There are two types of national maintenance service firms. One type serves mainly large retail chains and owners of multiple buildings. These firms qualify mechanical contracting businesses throughout the country as subcontractors. The qualified subcontractors are then considered part of the firm’s national service team. The number of subcontractors they have in a particular region or metropolitan area depends on the number of contracts they have for that area. This type of national firm usually does not

generally attempt to own any of its mechanical subcontractors. However, the firm itself may also be a full-service mechanical contractor with their own designers, installers and service technicians.

The other type of national maintenance service firm is also known in the industry as consolidators. They are currently buying up mechanical contracting firms nationwide. At this time, there are only a small number of these firms, but they may own several hundred smaller-to-medium mechanical contracting firms. Although a large number of their customers are currently residential, some are beginning to include light commercial buildings as part of their market. For the most part, the responsibilities for service contract delivery continue to remain with the local mechanical contractor. In some cases, the national service firm prefers to keep a low profile, allowing the acquired mechanical contractor to keep their original name and making little changes as to how business is conducted. Most, if not all, of these consolidators are publicly traded on the stock market. It remains to be seen how beneficial this consolidation effort will be for the commercial and retail building customers.

Specialized Service Contractors

The specialized service contractors provide the narrowest scope of O&M services. These contractors generally sell, install, repair and service a particular type of equipment, such as controls, refrigeration equipment, water treatment systems or electrical equipment. Their O&M service is often limited to the specific technology they sell and may be far less important as a bottom-line moneymaker than the sales of equipment. However, because they are very specialized and proficient in the technology and service they sell, owners and managers often purchase a service agreement in order to supplement the in-house staff's work.

Manufacturers

Manufacturers of HVAC equipment such as chillers, boilers, package units, fan systems, energy management control systems (EMCS), etc. often provide maintenance service contracts or agreements for the equipment they manufacture. Many of these manufactures also have the capability to provide maintenance on all other systems in the building including controls. Owners and managers often use the manufacture's service contract for a particular piece of equipment or system, such as a large chiller, boiler or EMCS to supplement their own in-house staff's work.

Maintenance Management Firms

Maintenance management firms usually provide full-time, on-site staff. The maintenance management firm might provide just the key management staff, such as the facility manager and chief operating engineer or they might provide these key personnel plus all of the technicians, including carpenters and painters. These firms are capturing the out-sourcing business of owners who determine that such an approach is less expensive than having their own in-house staff. These firms base a large portion of their business on O&M management and service. An emerging motivator for an owner to install this type of an arrangement is the amount of savings the contractor generates from improved O&M practices. The specific type contract these firms require is not discussed as part of this document.

Obtaining a Best Practice O&M Service Contract:

Although there are a variety of service contractors, each with their own marketing techniques and service contract packages, the buyer and user of these services can shape the service delivery process by remaining proactive in obtaining, developing, and overseeing the contract. The following discusses several activities and requirements for building owners and managers to consider when evaluating or upgrading their present maintenance service contract or obtaining a new contract. Not all of the suggestions offered below may be relevant to every situation. The suggestions should be used as a guide in obtaining the best possible contract for the building. Owners and managers should choose what is most important to include based on their needs and objectives. A best practice service contract is the result of informed owners and managers asking the right questions, having reasonable expectations, setting up easy ways to track information, establishing continuity, demonstrating interest and including clear enforceable language in the contract. Appendix A of this document contains a summary checklist of the activities necessary for obtaining a "best practice" O&M service contract.

Developing Objectives

Before obtaining a contract, addressing the questions below helps formulate the objectives for having a contract. This also helps understand what type of contract is appropriate or if one is needed:

- Is the building fully owner-occupied?
- How long does the owner intend to own the building?
- Is the building single-tenant or multi-tenant occupied?
- How sensitive is the tenant's or owner's operations to a constant and consistent building environment?
- What are the lease arrangements regarding mechanical systems?
  - Is the owner fully responsible for all the O&M for the building or are the tenants partially responsible?
  - How extensive are the tenant's responsibilities?
- How complex are the systems?
- How old is the equipment?
- If there is building staff, how capable are they and do they have adequate time to perform good preventive maintenance?

The following discusses a few scenarios that may emerge by answering the questions above.

If an owner intends to sell the building with in a year or two years, then an expensive, comprehensive service contract may not be appropriate. However, a contract that ensures short-term proper maintenance, with the objective of increasing the property value, or at minimum maintaining its present value for prospective buyers may be cost effective. During the "due diligence" process, buyers become informed about the condition of the building systems. Well-operated and maintained buildings showing good energy savings have a better chance of selling at a higher price. This higher price often recoups the cost of most types of service agreements.

If tenants are responsible for taking care of the equipment serving their area, the owner may choose not to have a service contract of any type. On the other hand, the owner may require the tenants to carry an inspection or PM type contract as part of the lease agreement. The owner may even have a requirement for which service provider to hire. This helps ensure that the mechanical equipment is not allowed to deteriorate, leaving the owner with expensive repairs after the tenant leaves.

For an owner who occupies the building, has a long-term commitment to the property, and has complex systems without the support of an expert in-house maintenance staff, a comprehensive contract such as a full-coverage contract may be most effective. In this case, the owner's objectives may include providing a high level of comfort, providing equipment reliability, operating the building as efficiently as possible to reduce energy costs and avoiding premature equipment failures.

Measurable Objectives

No mater which type of contract is selected, many owners agree that including measurable objectives in the contract is an important management tool. Measurable objectives help track how well the contractor is doing in providing results. It also helps the contractor understand where they need to improve. Some owners and contractors use a report card system to track progress on the measurable objectives. For example, if one objective is to reduce the number of comfort complaints from between 15 to 20 per month to between 0 to 3 per month, the owner may set up a system to track the number of comfort complaints following the placement of the service contract. The owner may then rate or grade the contractor's progress toward meeting the objective according to an agreed upon interval of time, such as monthly or quarterly. The end-results type contract discussed previously is based primarily on measurable results.

Once all of the objectives are established and the basic type of contract is agreed on, the owner and contractor can negotiate the modifications and additions during the bidding and selection process.

Screening the Contractors

Building owners and managers often hire service contractors based on recommendations by other building owners or managers. This approach may save time but in the long run it may not reduce risk or save money. A better way to find a contractor who fits the particular needs of your building is to get several names, then rigorously screen them before requesting bids. A rigorous screening process may seem time consuming but it practically eliminates any costly problems that could occur once the contract is signed. Ask whether the contractor:

- Will do a thorough assessment of the building systems before signing the contract agreement.
- Will modify their basic contract to fit the needs of your building systems and requirements.
- Has supporting documentation showing how various tasks are performed. For example, the contractor should have a policy/procedures manual defining each O&M task, such as check refrigeration pressures, and describing the methods used for accomplishing the task. Ask to see the manual.
- Has a database of recommended PM tasks, either by manufacturer or other reputable sources.
- Will provide a detailed service plan as part of the contract, stating what services will be performed, at what frequency and the time it takes to complete the service.
- Will use only environmentally-safe products when servicing the building.
- Will provide an itemized list of hourly rates for labor by skill level, charges for travel and cost of parts for each service performed.
- Has a maximum response time for emergencies (usually four hours).
- Will provide references from a one-year customer, a three-year customer and two customers of five or more years. Check the references.
- Have several customers that have been with them for five or more years.

With regard to service technicians (employees), ask:

- Will the contractor commit the same two or three technicians to the continual maintenance of the building?
- What level of service technicians will perform the work for the building?
- Will the contractor have capable service technicians available 24 hours per day, 365 days per year?
- Are they willing to provide resumes for the primary technicians assigned to the buildings?
- What is the turnover rate?
- Are the technicians CFC certified and do they have all other required state and local licenses?
- What qualifications and training are they required to have?
- Are they factory-trained on your building's brand of equipment and control system?
- Can they use your building's brand of EMCS to troubleshoot problems?
- Are the technicians able to use the trending capabilities of the building's EMCS to track data?
- Do they have access to and the ability to use state-of-the-art tools such as portable data loggers for measuring variables and troubleshooting operational problems?
- Are they required to wear clean company uniforms with nametags?

Also ask:

- What percent of the contractor's business is maintenance service?
- How long have they been in business?
- How many trucks do they have?

- Are their test instruments at least calibrated annually and are their methods of calibration traceable to the Bureau of National Standards?

In order to keep the screening information clear and organized during the screening process, Appendix B of this document presents an example screening form, which contains all of the questions listed above. Also, checking the potential contractor's credit or D&B rating can be revealing.

Obtaining Bids and Selecting a Contractor

Because no two building systems are alike and no two service contractors are alike in the way they provide or price service, it is important for the customer to take control and specify what they want and need. The following discusses some general methods that help owners and managers identify the O&M requirements for their building systems and help "level the playing field" for the bidders.

Once the screening process is complete, select and invite two to four potential contractors to do a thorough assessment of the facility prior to bidding on the work. If possible, conduct a "walk through" of the facility with all the potential contractors in attendance. Any questions that come up are heard by all along with the responses. Allow each contractor to review a set of building documentation including mechanical drawings, control strategies, sequences of operation, O&M manuals, etc. This helps the contractors understand how the building is suppose to perform and be maintained. Also, clearly communicate the objectives for needing a service contract.

After completing the assessments and the group "walk through", have each contractor submit a detailed scope-of-work proposal that includes all the O&M tasks for each piece of equipment, needed repairs, replacements and suggested upgrades. Using the information gained from each set of eyes, put together a more detailed specification spelling out all the requirements to be included in the contract along with the requirements for documenting and reporting information (see What to Include in a Best Practices Service Contract, below). This method "levels the playing field," allowing each contractor to have the same information for bidding purposes. This also immediately demonstrates the owner or manager's interest, understanding and commitment to getting the best possible contract for a reasonable price. It also eliminates some contractor's desire to downgrade the service in order to provide a lower bid. *What to Include in a Best Practice Service Contract*, below, discusses some major items to consider including in the contract.

Finally, have each contractor give a final bid based on the new specifications. To avoid any surprises, be clear about having the final bids include all applicable requirements and conditions from both the contractor and owner's side.

The above method of obtaining bids may be modified to fit the size and type of facility and the expertise of the owner or building staff. For a large complex facility, a building owner or manager may want to hire a third party, such as a consulting engineer who has practical hands-on field experience, to do the building assessment and help draw up the basic scope of work for the bid. However, this does not necessarily preclude the contractor's assessment. Many contractors, especially when bidding on a large facility, will want to do their own assessment to understand the age and condition of the equipment they will be servicing. For a smaller or less-complicated facility, the owner, manager or an expert building operator may be able to do the assessment and draw up a specification without calling on a third party. The manufacturers' O&M manuals are good sources for identifying the specific O&M tasks needed for each piece of equipment. The main purpose of the activity is to give all the contractors the same information and requirements in order to get the most cost effective contract, whether it is for several building systems or just one major piece of equipment.

The bids should be evaluated according to how well they meet the owner's specifications and price. If all the contractors are provided with the same information, the prices should not vary significantly. Understanding the potential contractor's hourly rate for the various levels of service (including overtime and emergency service) helps the owner evaluate the cost of the task work. However, the total price of some contracts will also reflect the contractor's attempt to anticipate those conditions that the contractor has little control over such as weather conditions and the possibility of frequent equipment breakdowns. Price is discussed in more detail below (see What is the Price of a Best Practice Service Contract).

Before finally selecting the contractor, the owner or manager should consider visiting the contractor's place of business. This allows the perspective customer to understand how organized and professional the contractor's place of business appears. Giving the right answers to the screening questions and

writing a good bid does not mean that the contractor isn't working out of his or her garage. Some managers even suggest sitting with the dispatcher for an hour or two to better understand the volume of demand for service and how customer needs are met. It should be noted whether the dispatcher is overwhelmed with calls and how they allocate resources.

What to Include in a Best Practice Service Contract

The following discusses some requirements that owners and managers should consider including in the service contract. Not all of the requirement discussed here are appropriate for every type of contract. However, the bulk of these requirements will apply to owners of larger and more complex facilities that are depending on an outside service contractor to operate and maintain their buildings.

Documenting, Tracking, and Reporting Requirements

It is important for the building owner or manager to develop requirements for how and what information needs to be reported and who needs to receive the reports, invoices and documentation. Clear channels of communications and documentation requirements should be specified in the O&M service contract. The following lists requirements that owners and managers should consider when hiring a contractor and developing the contract specifications:

- Require log cards be placed at each piece of equipment with date-of-last-service and any new parts that were installed. This gives new technicians, as well as the in-house staff, a quick understanding of the service status for each piece of equipment. Insist on legible handwriting.
- For companies using hand-held electronic recording devices, require a copy of the electronically-logged data either be placed on the on-site computer or a hard copy be sent to the maintenance office in a timely manner.
- If the facility has a CMMS, require the contractor to enter the service data into the software after each service call. Also, if a bar coded PM system is in place, require the contractor use the bar coding system to track PM work.
- Require the service technician sign a log when entering and leaving the facility. This gives the person responsible for authorizing payment a way to track actual hours spent in the building. Some owners and managers require the service technician not only sign a log but report to them upon entering and leaving the facility.
- Require a forms-based service ticket. This includes a complete task sheet listing the equipment serviced and explaining exactly what was done for every scheduled service call along with recommendations for improvements, repairs and replacements needed. At minimum, one copy should remain with the owner or manager (preferably in a ring binder) and one with the contractor. This gives a more detailed history of the service performed on the equipment than the log card, but does not necessarily replace the need for a log card system.
- Require measurements, such as motor amps and volts, temperatures, pressures, etc., be taken and documented for each piece of equipment, either on the equipment's log card or on a separate service sheet for the equipment. The purpose of gathering this data is to observe how the measurements change over time. This helps predict or reveal problems affecting efficiency and reliability. This also helps both the contractor and owner understand and justify when things need to be replaced, repaired or tuned. If an electronic hand-held recording device is used to capture the information, make sure the contractor provides a copy of the information to the owner or manager for review.
- Request the technician report any safety hazards or possible environmental quality problems directly to the owner/manager
- Require a copy of any test analysis results, such as oil analysis, water treatment analysis, boiler combustion analysis, etc. be sent or given to the building owner and manager for review.
- Have clear criteria stated in the contract for paying the bill. The criteria might include the following:
  - The technician performing the service must sign the service invoice.
  - The technician should clearly state each task, including time for labor, trip charges and what replacement parts where used. Require legible handwriting.

- Any electronically-acquired data is made available to the building staff and owner, either in hard copy or on a site-based computer.
- Turn all old parts in to a designated area or office.
- Include the building name, number or ID on the service invoice.
- Require the contractor provide a separate bill for additional work performed at the time of the regular PM visit. Also require that they obtain approval prior to performing the work if it exceeds a certain amount, such as $250.
- Place a time limit, such as 90 days, for receiving a bill, after which it will not be paid.

An arrangement in the contract for the owner to pay the total contract amount in twelve monthly payments does not preclude requiring several of the above criteria.

The Facility O&M Service Plan

Require the contractor submit a facility O&M service plan and schedule as part of the contract. The plan should be based on the building owner's needs and the building's design documentation. The plan should contain the equipment list and the operating, as well as the maintenance tasks for each piece of equipment or system, along with the frequency and time schedule for performing each service. The plan may be more or less detailed, depending on the size and complexity of the building systems. Consider including a combination of the following items as part of the facility's O&M service plan:

- A list of important data to be tracked over time, such as chiller performance and the analysis of what it tells us. Require that the chiller kW per ton for a given condition be tracked and reported over time.
- A list the tasks that target efficient operation of building equipment (see Adding the "O" to the Maintenance Service Contract).
- An O&M service plan for each piece of equipment, the tasks to be performed, the frequency (such as quarterly, semi annual, annual etc.) and the expected time needed to perform the tasks. [Appendix C of this document contains an example service plan for a chiller.]
- Annual start up and shut down plan for the cooling and heating systems, with a list the tasks included in each process.
- A list of tests to be performed only as often as equipment performance indicates a need. For example: eddy current test.
- A list of times (provided by the owner) when equipment cannot be shut off.

A comprehensive service plan often incorporates most of the other items listed above for the piece of equipment it addresses.

Adding the "O" to the Maintenance Service Contract

Most companies providing HVAC service contracts focus on the maintenance or care of equipment and systems. In fact, the industry usually refers to the service contract as a "maintenance" service contract. However, recent studies show that how equipment is operated accounts for most of the energy waste or energy savings. No matter how well the HVAC system and equipment is cared for, if it is operated poorly or operated when it could be off, the result is energy waste, possible premature failure, and lost dollars. Peter Herzog, in his book Energy Efficient Operation of Buildings, defines energy-efficient-operation as operating an energy-consuming device so that it consumes only as much energy as it needs to fulfill its intended function. Building owners and managers need to insist on requirements that address the operating issues as well as the maintenance issues in service contracts. The following lists tasks that specifically address efficient operation:

- Periodically check the following schedules to ensure equipment is operating only as much as needed to fulfill its intended function:
  - Time-of-day (TOD) schedules, holiday schedules and start-stop time optimization strategies set by the EMCS; mechanical time clocks, and programmable thermostats for HVAC equipment
  - Check lighting TOD schedules and sweep schedules as compared to HVAC schedules
  - Setup and set-back temperatures
  - Space temperature set point schedules
  - Reset schedules such as supply air, chilled water, heating water, etc.
  - Lockout schedules for economizers, chillers, boilers, etc.
  - Freeze protection set points
- Check that dead bands or lockout temperatures are sufficient to keep cooling and heating from occurring simultaneously unless its part of design intent for the building.
- Calibrate more frequently (more than once per year), those sensors critical to efficient operation. These include sensors used as control signals, such as outside air, supply air and mixed air sensors.
- Check that heating and cooling equipment is staging on and off in an optimal manner, including resistance heating.
- Check that air conditioning compressors are loading and unloading properly and efficiently.
- Check that boilers are firing optimally (low, medium, high fire).
- Check that all adjustable speed drives are functioning optimally and the minimum rpm set point does not inhibit turndown.
- Test that air and water economizers are functioning to take full advantage of free cooling.
- Check capacity strategies for cooling tower operation.
- Check that HVAC equipment has staggered start times (all or numerous motors should not start simultaneously at either morning startup or upon restoring power after a power outage) to help reduce the peak demand.
- Check that any soft start strategies are working properly to reduce in-rush currents and peak demand.
- Check that morning warm-up, pre-cool, and night purge strategies are working appropriately.
- Check that optimum start and coast-down strategies are functioning properly.
- Check that unoccupied spaces have heating and cooling equipment turned off or set points are at or exceeding the typical setbacks and setups for the building.
- Periodically check control strategies and schedules that are easily overridden or circumvented and return them to their normal operating mode if appropriate.

A building containing an EMCS may have a separate service contract specifically for the control system. In that case, the control service contract rather than the general HVAC service contract should cover several of the operating (“O”) tasks described above.

In order for any service contractor to successfully diagnose operating problems, they need to be able to measure and track the various parameters that indicate proper operation. Service technicians need to be trained to use the building’s EMCS to trend points that reveal operating problems or have (and be capable of using) portable data loggers as part of their diagnostic tools. It is not cost effective to have the technician stay for hours in a building or put in overtime (paid at a premium rate) to observe operating strategies. When the EMCS is inadequate or non-existent for a building, there are several types of data loggers on the market that capture information over time and use accompanying software packages to help analyze it.

Calibration Requirements

Instrument Calibration

It is important for the contract to include a section requiring the contractor's test instruments have up-to-date and valid calibration documentation. This may be in the form of a certificate from the manufacturer. If the instruments used to measure variables, check sensor calibration or troubleshoot problems are not calibrated on a regular basis, test- instrument errors could cause energy waste and comfort problems, as well as wasted time troubleshooting.

Instrument calibration may be performed by companies or government agencies regularly engaged in calibrating similar instruments, or by the instrument manufacturer. In either case, some form of documentation stating that the instrument was calibrated and the date is usually provided. The building owner or manager may request that a copy of the documentation be attached to the contract.

Equipment Calibration

Performing periodic calibration checks is one of the most important PM tasks for ensuring equipment and systems are performing optimally. Any sensors or instruments calibrated by the contractor should have a calibration label/sticker indicating the contractor's company, the technician performing the calibration and the date of calibration.

CFC Certification and Requirements, and Material Safety Data Sheets

CFC Certification and Requirements

The Federal Clean Air Act of 1990 contains requirements regarding venting, recovery, recycling and replacement of chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and other refrigerants used in air conditioning and refrigeration systems. In order to assure compliance some owners require the service contractor sign a refrigerant policy agreement. [Appendix D of this document contains an example Contractor Refrigerant Policy Agreement. This agreement may be modified to include additional requirements.]

The owner should also consider requiring the contractor to track refrigerants on the site, including current inventory, equipment leaks and leakage rates. Also, as a result of a refrigerant change out, require the to contractor issue a credit for old refrigerant of at least 75% of the current wholesale market price.

Materials Safety Data Sheets

As part of the contract, require the contractor to provide copies of Material Safety Data Sheets (MSDS) prior to bringing any chemical on the site that is required for performing a service task. Clearly state that unless the contractor receives written approval from the owner, any chemicals brought on the site shall be removed from the site by the contractor, along with any waste associated with those chemicals. Hazardous chemicals shall not be put into the owner's waste stream.

Contract Cancellation, Protocols and General Considerations

The following discusses several other contract considerations, including what might constitute a contract cancellation and protocols for the contractor's technicians to follow when on the building site.

Contract Cancellation

The owner or manager should have clear contract language stating what would constitute grounds for cancellation of the contract and the time period after which the cancellation would be effective. Having a cancellation clause in the contract motivates the contractor to meet the owner's requirements. Some owners reserve the right to cancel any service contract or agreement with a thirty-day written notification and do not list any reasons. Others list examples of what they would consider serious enough violations to cause cancellation. These might include:

- Failure to respond within the contracted time period for an emergency
- Poor conduct on the part of the service technician

- Failure to perform the contracted PM tasks adequately or in a timely manner
- Interference with the owner's operations or personnel

Cancellations of a full-service type contract that include repair and replace coverage may be trickier and more complicated from both the owner's and the contractor's position. It is advisable to have some language in the contract that prevents either party from bearing the full economic brunt of a cancellation. For example, if an owner decides to cancel a three-year contract two years early and the contractor has just installed and paid for a substantial piece of mechanical equipment, the contractor should be fairly compensated by the owner for that piece of equipment. On the other hand, if the contractor decides to cancel the contract early, the owner should reserve the right to have a third-party do an assessment (at the contractor's expense) of the system under contract to determine whether there are any major problems. The outgoing contractor should then correct the problems before leaving. The economics in both cases should be based, in part, on the time remaining on the contract as compared to the original length of the contract.

Protocols

The owner and manager should spell out in the contract the protocols they want followed regarding security issues and the use of building facilities. The following suggests a list of protocol topics for inclusion in the contract:

- Special security or access areas
- Use of restrooms, kitchens, cafeterias and employee lounges
- Designated smoking areas
- Staging areas for installation work and storage areas for ladders and tools
- Parking requirements
- Special safety requirements
- Lock out/tag out (LO/TO) requirements. Require the contractor to provide a copy of his LO/TO program or to use the owner's LO/TO program.
- Recycling requirements.

General Contract Considerations

The following lists some general contract requirements for consideration:

- State that the contractor cannot under any circumstances subcontract the work to another firm. Or, if the arrangement allows the primary contractor to use subcontractors, require a list of all subcontractors and that all contract requirements also apply to the subcontractors.
- Require the service contractor to pay the bill when they fail to respond to an emergency within the agreed on time period (under normal seasonal conditions) causing the owner to call in another firm to handle the problem.
- Require the contractor sign for any keys to the building. If the contractor is given a grand master key, the owner should consider having them agree to re-key the building at their own expense if the master key is lost.
- Require a Safety/Accident records for the past two years. This should include the number of "Lost Day Cases" for that period. (Preferably the number of LDC's should be very low, depending on the size of the contractor.)
- Require the contractor provides all personal protective equipment (PPE) such as harnesses, hard-hats, safety glasses, breathing protection, etc., and the service personnel are all trained, and qualified in their use.
- Require evidence that the contractor holds regular safety meetings with their technician.

Require the contractor also include:

- The minimum liability insurance coverage the contractor has along with a copy of the certificate.
- A copy of the performance bond (if required).
- Workmen's compensation coverage limits and proof of coverage.

What is the Price of a Best Practice Service Contract?

Contract prices can range from under $300 per year to several thousands of dollars per year depending on the contract type and the added custom features needed to meet the owner's objectives. In order to lessen the price discrepancies among bids, it is important for owners and managers to supply each potential bidder with the same information. (A method for doing this is discussed in Obtaining and Selecting a Best Practice Service Contract.)

Service contract prices also vary depending on the type and condition of the building equipment, hours of operation (24 hours per day vs. 10 hours per day), the owner's budget constraints, and what region of the country the building is located. Because of the many variables, standard pricing except for inspection-only type contracts is generally non-existent. Even with the inspection-only contract, the size of the building and amount of equipment included for inspection will sometimes alter the price of the standard contract. Knowing how many variables are factored into pricing a service contract, owners and managers should beware of contractors claiming to have a standard price for their different levels of service contract offerings.

Based on the amount of risk that the contractor bears, pricing for the full-service contract and full-labor contract is considerably more complicated than the other types of contracts. The price for these contracts usually goes up depending on how much risk the contractor takes. The risk is highest for the full-service contractor offering breakdown insurance if equipment is middle-aged to old, in a dirty environment, has received little to no maintenance, or operates longer than average. The contractor also gambles on the weather. If the cooling, heating and swing seasons are average for the area, the contractor usually does well for the term of the contract. However, if cooling seasons are hotter than usual or heating seasons are colder than usual, the contractor providing a full-coverage type contract may see substantially reduced profits over the term of the contract.

For a typical mechanical contractor providing journey level service, hourly rates vary from approximately $35.00 to $90.00 per hour depending on the region of the country and size of the community (small cities vs. large cities). EMCS technicians and other specialized technicians may be billed out at higher rates than the typical HVAC service technicians serving the same area.

Keep in mind, no mater which type of contract is selected, most contracts have a minimum gross margin of 50% (contract cost times two).

Tips for Managing and Overseeing a Best Practice Service Contract

Once a service contractor is selected and the work begins, it is important for the owner or manager to provide some oversight in order to keep the contract functioning as a "best practices" service contract. The following highlights some activities that help to successfully manage a service contract.

Communication

- Establish clear lines of communication on who to contact and what protocols to follow regarding emergency services, after-hours service, and regular PM visits.
- Set up a feedback system to let the contractor know how they are doing.
    - Periodically review with the contractor any measurable objectives that are part of the contract.
    - Use a quarterly report card as part of the feedback system. (Refer to Measurable Objectives, above.)
    - Let them know when they are doing a good job

Documentation and Review

- Periodically review the contract documents. Over time, there is a tendency to forget some of the many requirements the contract contains.
- Designate a notebook for contractor-gathered data. Require the contractor leave a copy of any performance data or documentation they gather during service calls in the designated notebook. This provides the owner, manager, and building staff a history of equipment performance.
- Periodically review and analyze, with the contractor, any equipment performance data they are required to track. This ensures that the contractor is obtaining and recording the correct data and that equipment is performing optimally. Have the technician responsible for gathering the data explain its meaning.
- Keep all building documentation (drawings, manufacturer's O&M manuals, sequences of operation, etc.) on site, in one location, and readily available to the contractor for reference.

Perform Spot Checks

- Do periodic spot checks of mechanical equipment after PM visits to ensure that the work contracted for is being performed. This may or may not be done with the contractor present. Document the findings. Take photographs if necessary. Also notice if the PM log card is properly filled out. Is it legible and understandable?
- If in-house staff are available have them periodically oversee the contractor's work.
- Do periodic spot checks of the contractor's trucks. How the contractor maintains their own equipment and supplies may reflect how they maintain the facility's equipment. Disorganized and dirty service vehicles may indicate a problem with the particular service technician or the contractors business in general.

Appendix A: Eight-Step Action Summary for Obtaining a Best Practices O&M Service Contract

1 Develop objectives for obtaining an O&M service contract such as:

- Provide maximum comfort for building occupants.
- Improve operating efficiency of mechanical plant (boilers, chillers, cooling towers, etc.).
- Apply preventive maintenance procedures to reduce chances of premature equipment failures.
- Improve operating efficiency of all mechanical systems (reduce energy waste).
- Augment the in-house staff's work so their time can be used more effectively.
- Periodically inspect the building systems to avoid emergency breakdown situations.

The objectives for the hiring a service contract often dictates the type of contract that is most appropriate. It is important to understand all of the objectives prior to the screening process and to clearly communicate the objectives to the contractors throughout the screening, bidding and selection processes. Also, include a detailed description of the measurable objectives and the methods used for tracking these objectives.

2 Develop and apply a screening process. The screening process may be more or less rigorous depending on the owner's objectives and the size, number and complexity of the facilities involved.

3 Have all building documentation available in one place. Include:

- Mechanical and Electrical Drawings
- Equipment List
- Test, Adjusting, and Balance Report
- Control System Documentation
- Sequences of Operation and Control Strategies (warm-up, optimum start, night purge, etc.)

4 Select two to four potential contractors and obtain initial proposals based on each contractor's building assessments. During the contractors' assessment process, communicate the objectives and expectations for the O&M service contract and allow each contractor to study the building documentation.

5 Develop the major contract requirements using the contractors' initial proposals. Make sure to include the requirements for documentation and reporting. Competent in-house staff or a third-party may also develop contract requirements.

6 Obtain final bids from the potential contractors based on the owner-developed requirements.

7 Select the contractor and develop the final contract language and service plan.

8 Manage and oversee the contracts and documentation. Periodically review the entire contract. Build in a feedback process.

Appendix B: Contractor Screening Form

Some of the questions in this form may be more important than others, depending on the owner or manager's objectives for a service contract, the size of the facility and the complexity of the equipment. Check marks, yes/no answers, or scores are placed in the columns under the names of the companies being rated. When using a scoring system, weights of importance may be assigned using the column titled "weight factor."

Screening Questions	Weight Factor	Company A	Company B	Company C	Company D	Comments
Ask If The Contractor:						
Will do a thorough assessment of the building systems before signing the contract agreement.						
Will modify their basic contract to fit the needs of your building systems and requirements.						
Has a policy/procedures manual describing methods on how various PM tasks are performed. Ask to see the manual.						
Has a database of recommended PM tasks by manufacturer or other reputable sources (obtain the name of the source).						
Will provide a service plan for each piece of equipment, stating what tasks will be performed at what frequency and the time it takes to complete each task.						
Will use only environmentally safe products when servicing the building.						
Will provide an itemized list of hourly rates for labor by skill level, charges for travel and cost of parts for each service performed.						
Has a maximum response time for emergencies (usually four hours).						
Will provide references from a one-year customer, a three-year customer and two customers of five or more years. Check the references.						
Has several customers that have been with them for five or more years.						
With Regard To Service Technicians, Ask:						
Will the contractor commit the same two or three technicians to the continual maintenance of the building?						
Will the contractor have capable service technicians available 24 hours per day, 365 days per year?						
Are they willing to provide resumes for the primary technicians assigned to the buildings?						
What is the turnover rate?						

Screening Questions	Weight Factor	Company A	Company B	Company C	Company D	Comments
Are the technicians CFC certified and do they have all other required state and local licenses?						
What qualifications and training are they required to have?						
Are they factory-trained for your brand of equipment and control system?						
Can they use your building's brand of EMCS to troubleshoot problems?						
Do they have access to and the ability to use state-of-the art portable data loggers for measuring variables and troubleshooting operational problems?						
Are the technicians able to use the trending capabilities of the building's EMCS to track and compare data?						
Are they required to wear clean company uniforms with nametags?						
Also Ask:						
What percent of the contractor's business is maintenance service?						
How long have they been in business?						
How many trucks do they have?						
At minimum, are their test instruments calibrated annually and are their calibration standards traceable to the Bureau of Standards?						

Appendix C: Chiller PM Service Plan

Description	Monthly	Quarterly	Semi-Annually	Annually	As Required by Perform-ance	Time Needed to Complete Task	Level of Technician Performing the Task
I. COMPRESSOR							
A. Performance Evaluation (log conditions and analyze/submit copy to FM)	O						Journey
B. Motor							
Meg. Windings (see note on page 3)			X .75			0.75	Journey
Ampere Balance (within 10%)		X .25				0.25	Journey
Terminal Check (tight connection, clean)				X .50		0.50	Helper
Motor Cooling (check temperatures)		X .25				0.25	Journey
C. Lubrication System							
Oil Lines Temperatures	O						Helper
Water (Refrigerant) Coolant Temperature	O						Helper
Oil Cooler Strainer (water)				X			
Oil Cooler Solenoid Operation		X					
Oil Analysis			X				
Oil Appearance	O						
Oil Filter Change					X		
D. Vane Operation							
Compressor Loads:							
Operate Manual Switch		X					
Record Motor Amps		X					
Compressor Unloads							
Operate Manual Switch		X					
Record Motor Amps		X					
E. Internal Compressor Check					X		
II. CONTROLS							
A. Operating Controls							
Check LRT Settings and Operation			X				
Check Vane Control Setting and Operation			X				
Verify Motor Load Limit Control			X				
Verify Load Balance Operation			X				
Check Oil Pump Contactor			X				
Check Soft Start Settings and Function							
Check Chilled Water Reset Settings and Function			X				
OSA = 75 deg./LCHW = 44 deg., OSA = 60 deg./LCHW = 55 deg.							
Check Chiller Lock-Out Set point = 55 deg.			X				
B. Protective Controls							
Test Operation of:							

Description	Monthly	Quarterly	Semi-Annually	Annually	As Required by Perform-ance	Time Needed to Complete Task	Level of Technician Performing the Task
Alarm Relay		X					
Pump Interlocks		X					
Hot and Cold Oil Temperature Switches		X					
Surge Guard Relays		X					
High and Low Pressure Switches		X					
High Suction Temperature Switches		X					
High Discharge Temperature Switch		X					
Low Pressure Override Switch		X					
Oil Pump Pressure Differential Switch		X					
Oil Pump Safety Timer		X					
Oil Pump Time Delay Switch		X					
System Monitor Timer		X					
Vane Closed Switch		X					
III. CONDENSER							
A. Performance Evaluation (log conditions and analyze/submit copy to FM)	O						
B. Test Water Quality		X					
C. Clean Condenser Tubes				X			
D. Eddy Current Test – Tube Wall Thickness					X		
E. Seasonal Protection					X		
F. Check Set Points:							
Condenser Water = 70 deg.							
Bypass = 60 deg.							
IV. EVAPORATOR							
A. Performance Evaluation (log conditions and analyze/submit copy to FM)*	O						
B. Test Water Quality		X					
C. Clean Evaporator Tubes (as required)				X			
D. Eddy Current Test - Tube Watt Thickness (as required)					X		
E. Seasonal Protection					X		
V. EXPANSION VALVES							
A. Performance Evaluation (superheat control)		X					
VI. COMPRESSOR-CHILLER UNIT							
A. Performance Evaluation (log conditions and analyze/submit copy to FM)	O						
B. Leak Test							
Compressor Fittings and Terminal		X					
Piping Fittings		X					
Oil Pump Joints and Fittings		X					
Vessel Relief Valves		X					

Description	Monthly	Quarterly	Semi-Annually	Annually	As Required by Perform-ance	Time Needed to Complete Task	Level of Technician Performing the Task
C. Vibration Isolation Text					X		
D. General Appearance							
Paint				X			
Insulation				X			
VII. STARTER(S)							
A. Examine Contactors (hardware and operation)		X					
B. Verify Overload Setting and Trip		X					
C. Test Electrical Connections		X					
D. Pump Down Control (verify operation)		X					
VIII. OPTIONAL CONTROLS							
A. Hot Gas Bypass Controls (verify operation)		X					
B. Liquid Injection Controls (verify operation)		X					
C. Pump Down Control (verify operation)		X					
TOTAL HOURS							

Key:

O -- Performed by In-House staff

X -- Performed by Service Contractor

Note: Some centrifugal chillers use power factor capacitors and some use surge capacitors. The capacitor may be installed out of sight in the compressor motor terminal box. In all cases, capacitors must be disconnected from the circuit to obtain a useful megger reading. Failure to do so will produce a low reading. In handling electrical components, only fully qualified electrical technicians should attempt service.

Chiller Start-up and Shut-Down Procedures

A journey level technician performs the cooling season start-up and shutdown tasks with the assistance of a helper level technician.

A. The Cooling Season Start-Up Preparation and Inspection

The following tasks prepare your unit for cooling duties with reliability, safety and efficiency:

1. Pressurizing the unit and conducting a leak check
2. Checking refrigerant and oil levels
3. Checking oil sump and purge oil heaters and temperatures
4. Checking and testing all operating and safety controls
5. Checking the starter operation
6. Starting the chilled water pump
7. Starting the condenser water pump and cooling tower
8. Starting the chiller and calibrating controls

9 Checking purge unit operation

10 Logging operating conditions after system and unit stabilize

11 Reviewing operating procedures and owner's log with operator

12 Checking auxiliary equipment operation

TOTAL HOURS TO COMPLETE:

B.The Annual Equipment Shutdown Inspection and PM

The following tasks are performed once each year during a shutdown period in order to properly evaluate your equipment status and prepare your unit for the next cooling season:

1 Checking the Compressor-Motor Assembly for the following items and performing PM tasks as indicated:

- Recording voltages
- Megging and recording motor winding resistance
- Lubricating open motor
- Checking the alignment on open motor drive units
- Checking the coupling
- Checking seals
- Checking inlet vane operator and linkage; lubricating where required

2 Checking the Compressor Oil System for the following items:

- Changing oil, oil filter and dryer
- Conducting analysis on oil and oil filter at an independent laboratory
- Checking oil pump, seal and motor
- Cleaning the dirt leg
- Checking heater and thermostat
- Checking all other oil system components including cooler, strainer and solenoid valve where applicable

3 Checking Motor Starter and performing the following tasks:

- Running diagnostic check
- Cleaning contacts or recommending replacement
- Checking linkage
- Megging motor
- Checking all terminals and tightening connections
- Checking overloads, dash pot oil and calibrating
- Cleaning or replacing air filter where required
- Dry running starter (or before start-up); checking status lights

4 Reviewing the Control Panel for the following items:

- Running diagnostic check of Micro Control Panel
- Checking safety shutdown operation
- Checking all terminals and tightening connections
- Checking Display Data accuracy and set points

5 Reviewing the Purge Unit for the following items:

- Inspecting the operation of the unit
- Changing oil
- Changing filter dryer

- Cleaning orifice in the liquid feed line to coil
- Cleaning the foul gas strainer
- Cleaning solenoid valves
- Cleaning purge drum, checking and cleaning float valve; replacing gaskets
- Checking heater operation
- Checking all other components for proper condition and operation; recording pressure control set point

6 Checking the Condenser for the following items:

- Checking the water flow
- Checking flow switch operation
- Removing condenser head and inspecting end sheets
- Mechanically brush-cleaning condenser water tube

7 Checking the Cooler for the following items:

- Checking the water flow
- Checking flow switch operation
- Checking refrigerant level

8 Checking the System for the following items:

- Conducting a leak check and identifying leak sources
- Adding refrigerant as required (10 percent maximum included)
- Recording condition of sight glasses
- Checking the refrigerant cycle to verify the proper operating balance
- Checking condenser water and chilled water heat transfer

9 General items included:

- Repairing insulation removed for inspection and maintenance procedures
- Cleaning equipment and surrounding area upon completion of work
- Consulting with the operator
- Reporting deficiencies and repairs required

TOTAL HOURS TO COMPLETE:

Appendix D: Contractor Hazardous Materials And Refrigerant Policy Agreement

The contractor agrees that it will use/provide only environmentally safe products while doing business with (Company Name_____), its subsidiaries, affiliates and employees in fulfillment of this contract; that it shall describe in detail any products it shall use or provide, including necessary specifications indicating that they meet with all requirements of law: that it shall dispose of any material considered to be “hazardous” under any Federal, State, or Local statute, regulation, rule or ordinance in a lawful and environmentally safe manner: and that it indemnifies and holds harmless (Company Name _____) from any loss, damages or liabilities incurred as a result of use by or on behalf of (Company Name_____) of such products.

The contractor shall provide to the facility owner or manager **and** post in conspicuous location all applicable Material Safety Data Sheets.

Refrigerant Policy Agreement:

I, _____, do hereby acknowledge that all of our service technicians have received training on venting, recovery, recycling, and replacement of chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and other refrigerants used in air conditioning and refrigerant systems, units, and small appliances, and have taken and passed an EPA-approved test appropriate for the equipment that they service and/or dispose of.

I agree that all of our service technicians will follow procedures for servicing, repairing, and disposing of any and all refrigerant-containing devices, units, and systems as outlined by company policy and federal, state, and local laws and regulations now in effect or hereinafter enacted which pertain to the Federal Clean Air Act of 1990.

I am aware of the significant harm to the earth’s atmosphere when refrigerants are vented into the air. We agree not to willfully vent refrigerants into the air under any circumstances.

I understand that our organization will be held responsible and liable if I, or any of our service technicians willfully violate the Federal Clean Air Act of 1990 regarding venting of refrigerants and we are liable for any and all fines associated with violations (currently up to $25,000 per occurrence). Any unintentional venting will be documented in accordance with company policy.

I understand that if we willfully violate the Clean Air Act of 1990, we willfully protect, indemnify, hold harmless, and defend (Company Name_____) from and against any and all liability regarding the handling, venting, and/or disposal of any and all refrigerants.

We also agree to provide a copy of the Federal Certification numbers for all service technicians. Should any certifications be revoked, we will notify (Company Name_____) immediately.

Signed: _____

Printed Name: _____

Company Name: _____

Date: _____

Technician Name: _____

Certification Number: _____

Use space below and back if needed to complete technician information.

_____

_____

_____

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