

Operations & Maintenance

- Comprises the majority of daily activities
- Perception that this 'is' Facility Management
- Backbone of Facility Management
- First place to realize cost savings
- Most visible activity of a facilities department



Operations & Maintenance Overview

- Encompasses the needs of a facilities grounds, equipment, utilities, mechanical and electrical systems
- Provide an optimum physical environment for the organization to accomplish its goals
- Provide opportunities to increase productivity in the workplace while reducing costs
- Six functional areas:
 - Budgeting
 - Initiating
 - Planning
 - Scheduling
 - Implementing
 - Reporting



Four Major Components

- Building Systems
- Building Structures & Permanent Interiors
- Furniture, Fixtures & Equipment (FF&E)
- Grounds and Exterior Elements



Operations & Maintenance Competencies

- Oversee acquisition, installation, operation, maintenance and disposition of Building Systems.
- Manage the maintenance of Building Structures and Permanent Interiors.
- Oversee acquisition, installation, operation, maintenance and disposition of Furniture and Equipment
- Oversee acquisition, installation, operation, maintenance and disposition of Grounds and Exterior Elements.



Building Systems

- Define Building Systems
- Assess the need for Building Systems
- Recommend Building Systems
- Manage the purchase and life cycle of Building Systems
- Recommend policies
- Establish practices and procedures



Building Systems

- Determine & administer allocation of building systems resources
- Monitor & evaluate building systems' performance
- Manage corrective, preventive & predictive maintenance
- Develop Emergency procedures
- Implement disaster recovery plans.



Building Systems

- Typically- 4 basic systems
 - Roof
 - Slab/Foundation
 - Mechanical/Plumbing
 - Electrical
- Could also include
 - Substructure
 - Superstructure
 - Interior Construction
 - Special Construction
 - Site work



Roof & Slab

- Life of Roof
- Composition of Roof
- Penetrations
- Runoff & Load Bearing
- Cracks in Slab
- Hydrostatic Pressure



Electrical

- Regulated vs. Non-Regulated
- Main Public Utility Power
- Service Entry Switchgear
- Emergency Generators
- Lighting



Lighting

- Exterior & Interior
- Fixture Types
 - Lamps (T12, T8, T5, T2)
 - Fluorescent, incandescent
 - Metal Halide, High Pressure Sodium
 - Ballasts
- Life Safety Lighting
 - Exit Signage
 - Emergency Lighting



HVAC

- Heating
- Ventilating
- Air Conditioning Systems
 - Distributions Systems
 - Support Systems



Heating

- Central Station (AHU)
- Distribution
 - Base Board, Space heaters, Heat Pumps, Radiator
- Heating Loops
 - Under floor or exterior for ice/snow melt
- Heating support systems
 - Steam/hot water boilers
 - Exchangers, circulating pumps



Ventilating

- Ventilating fans
 - Wall/roof mounted
- Exhaust Fans
 - Restrooms
 - Hoods, Laboratories & Kitchens
 - Janitorial
 - Smoke & Fire Suppression evac



Air Conditioning

- Central Station (AHU)
- Rooftop/On Ground/In Room mounted
- Air Distribution Systems
 - Constant Air Volume
 - VAV
 - Supply/Return
 - Ducting
- A/C Support Systems
 - Chillers, Cooling Towers, Pumps



Keys to Effectiveness

- Maintenance
- Testing
- Evaluating
- Documentation



Operational Costs

- Staffing (In-House or Out-Source)
- Operating Requirements
- Equipment & Supplies
- Lighting
- Energy Consumption



Plumbing

- Metering
- Irrigation
- Fire Protection
- Potable Water
- Domestic Hot Water



Plumbing Systems

- Waste Collection & Discharge
- Sanitary Waste Collection
 - Fixtures (Energy Policy act 1992)
 - Floor Drains & clean-outs
 - Waste & vent stacks
 - HAZMAT
- Process Support Systems
 - Compressed air, compressors, dryers/filters
 - Piping, discharge
 - Vacuums, pumps



Storm Water Systems

- Roof Drains
- Area Drains
 - NPDES
 - Water Board Mandates
 - Eliminate waste discharge to public drains
- Building Foundation Drains



Fire Protection

- Water Based
 - Back flows, Risers, sprinkler heads
- Dry Pipe
 - Pre-action, Fire hose & cabinet, stand pipe & valve
- Chemical Based
- Gas Based
- Support Systems
 - Detectors, pull stations, panels, pumps



Transport Systems

- Vertically Moving (Elevators)
- Horizontally Moving (Escalators, Walkways)
- Conveying Systems
- Trash/Waste Collection
- Pneumatic Transport
- Safety Rules



Maintenance Performance Levels

- Custodial
- Preventive
- Predictive/Proactive
 - Life Cycle Studies
- Emergency
- Corrective
- Deferred



Systems Acquisition

- Need/Process for Acquiring New Systems
- Establish Basic Maintenance Objectives
- Understand the Commissioning Process
- Two Approaches
 - Design-bid-build-install-commission (Arch/Engr)
 - Design-build-install (contractor/vendor)



RFP (RFQ)

- Scope of Work
- Existing Conditions
- Proposed Schedule
- Proposed Budget
- Expected Deliverables



RFP Response

- Reflect RFP Language & Sections
- Services
- Commitment to Schedule & Budget
- Project Manager & Team
- Compensation Fees & Reimbursables
- Sample Contract
- Limits of Professional Liability Ins.
 - E&O



Security

- Determine Level Needed
 - Local crime rate, surrounding business types & security level
 - corporate assets, history of internal theft
- Monitoring
 - Building Access, visitors, parking garages/lots
- Exterior Devices
- Documentation
- Local Emergency Services



Janitorial

- Tasks & Schedule
- Square Footage
- Quality Assurance
- Recycling Program
- Green Cleaning Requisites
- I-9 Compliance



Building Structures & Permanent Interiors

- Evaluate building structures & permanent interiors
- Manage the maintenance and cleaning needs of building structures & permanent interiors



Furniture and Equipment

- Assess needs & oversee acquisitions
- Recommend policies
- Establish standards, practices & procedures
- Evaluate furniture & equipment performance
- Manage the maintenance and cleaning of furniture & equipment.



Grounds & Exterior Elements.

- Assess the effect of climatic & extreme environmental conditions
- Assess the need for alterations in grounds and exterior elements
- Recommend policies
- Establish standards, practices and procedures
- Evaluate the performance of grounds & exterior elements
- Manage the maintenance and custodial needs of grounds & exterior elements.



Grounds Maintenance

- Irrigation practices
- Sprinkler system-Automated, Drip
- Plantscape
- Seasonal Schedule
- Over watering & runoff
- Damage & plant replacement



Policies Procedures & Practices

- Policies- General Guidelines
- Procedures & Practices-Support their implementation
- Cover areas such as:
 - Indoor Air Quality
 - Energy Conservation
 - Water Conservation
 - Recycling Programs
- FMs need solid understanding of profession in order to create & implement good PPPs



Emergency Plans & BCP

- Safety Procedures
- Evacuation Plans
- Business Continuity
 - Hot Sites
 - Communications
 - Business Recovery
 - CERT



Questions

Oversee acquisition, installation, operation, maintenance and disposition of building systems

- A comprehensive preventive maintenance program is vitally important because:
 - A. It forestalls unexpected equipment breakdowns
 - B. It provides an early warning of impending equipment problems
 - C. It provides a flexible work backlog to keep employees busy during slack times
 - D. It impresses management with your planning capabilities.



Oversee acquisition, installation, operation, maintenance and disposition of building systems

- The ratio of the maximum demand on an electrical system to the total connected load of the system is known as the:
 - A. Energy factor
 - B. Load factor
 - C. Power factor
 - D. Demand factor



Oversee acquisition, installation, operation, maintenance and disposition of building systems

- What is the best reason for using an automated temperature control system in a facility?
 - A. Reduce electrical use
 - B. Ensure comfort of all employees
 - C. Keep temperature constant
 - D. Control energy costs.



Oversee acquisition, installation, operation, maintenance and disposition of building systems

- You manage a multiple – building facility that is expanding. When is it correct to install a central chiller?
 - A. When the cost of installation is offset by energy savings
 - B. When energy costs become a major expense
 - C. When cost of the present system becomes a significant part of operations
 - D. Once expansion is complete.



Oversee acquisition, installation, operation, maintenance and disposition of building systems

- What is the main reason to install a UPS system?
 - A. Manage load shifts
 - B. Ensure correct voltage to users
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Oversee acquisition, installation, operation, maintenance and disposition of building systems

- What is the most cost effective method to enhance security?
 - A. Increase employee awareness
 - B. Increase security staff
 - C. Increase security at facility entrances
 - D. Increase video surveillance.



Manage the maintenance of building structures and permanent interiors

- Which of the following types of flooring would you recommend for installation in a commercial kitchen?
 - A. Commercial grade carpet that is easy to walk on
 - B. Linoleum which has a luster and never needs to be waxed
 - C. Non-slip quarry tile with tile coverings at walls
 - D. Concrete which is easy to sweep and damp mop.



Manage the maintenance of building structures and permanent interiors

- What is the greatest driver in prioritizing your Operations and Maintenance budget and schedule?
 - A. Increase in deferred maintenance costs
 - B. Maintenance inspection reports
 - C. Potential health and safety hazards
 - D. Corporate business plans.



Oversee acquisition, installation, operation, maintenance and disposition of Furniture & Equipment

- Why should carpet be laid out before delivery to the installation site?
 - A. To inspect for defects
 - B. To pre-cut for room size
 - C. To allow time for out gassing
 - D. To make sure there is enough for the job.



Oversee acquisition, installation, operation, maintenance and disposition of Furniture & Equipment

- What is the best reason to implement office standardization?
 - A. Employee satisfaction levels will increase
 - B. Modular furniture has been improved
 - C. Corporate culture has changed
 - D. Optimum space utilization will be achieved.



Oversee acquisition, installation, operation, maintenance and disposition of grounds and exterior elements

- You have just bid a landscape maintenance contract. The low bidder is unable to provide I-9 (right to work) forms for its foreign born laborers. What should you do?
 - A. Disqualify the bidder
 - B. Hire the low bidder if he can provide forms within 90 days
 - C. Refer the problem to the legal department
 - D. Agree to hire the low bidder if he does not use employees without forms.



Answers

Oversee acquisition, installation, operation, maintenance and disposition of building systems

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