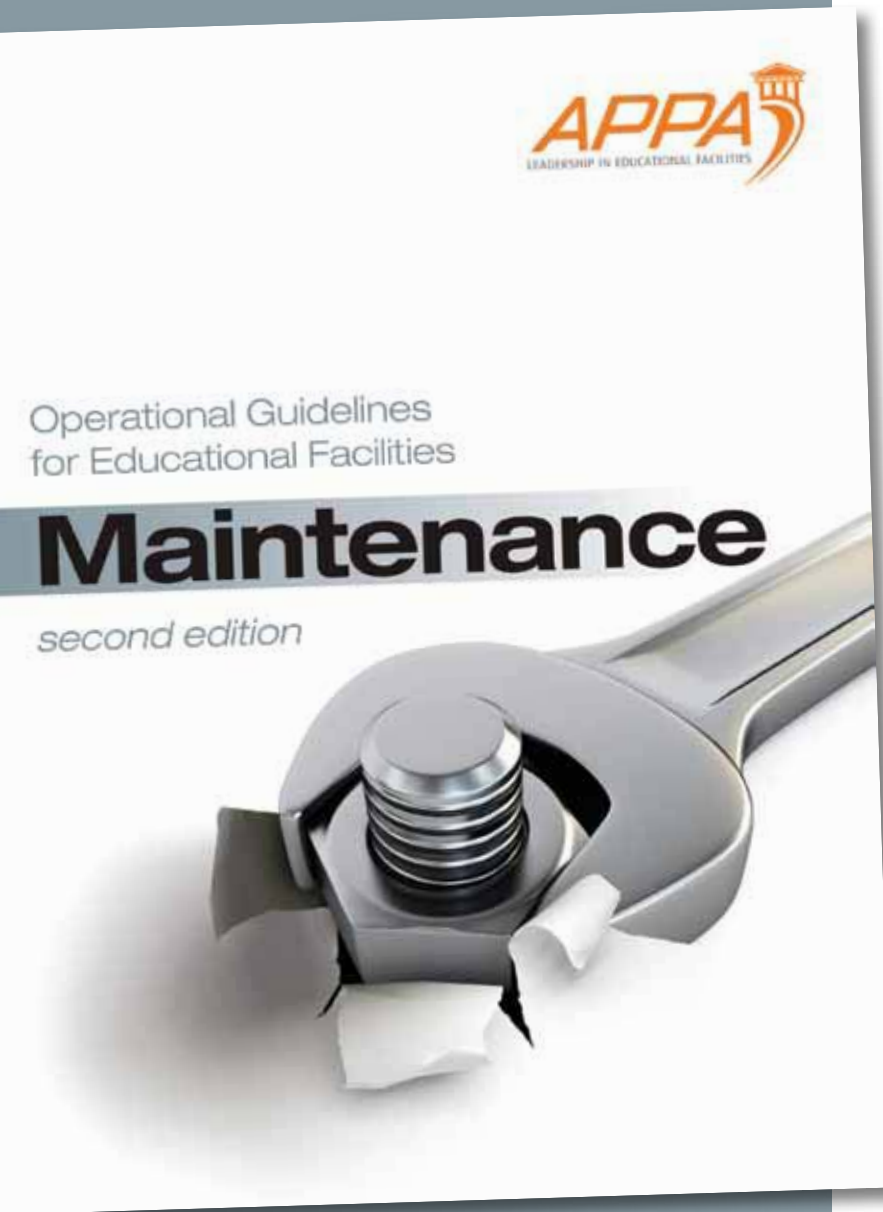
WHAT CONSTITUTES MAINTENANCE?

BY J. THOMAS BECKER



In most cases the facilities inventory of an educational institution is its largest fiscal asset. The physical plant or facilities management department is the steward for keeping that asset from becoming a liability. Our principal charge is to make sure that the building inventory maintains its ability to function as intended, that it is safe and legal, and that its life is perpetuated to the greatest extent possible.

Customers' expectations have accelerated exponentially. The electronic age has become intermingled with everyday life. In response to catastrophic events, security systems and building access systems have quickly become more elaborate. The economic crisis has forced our profession to try to improve efficiency in almost all aspects, from energy management to sustainability to staffing assignment.

Material inventories are tighter and not as easily available. Information about our operations is requested to be more transparent. Benchmarking and performance ratios are now expected management tools. Methodologies for implementing ongoing improvement, and having tools in place to measure that improvement, are now looked for when accrediting bodies visit campus.

To quantify performance criteria, both internal and external definitions and measurements need to be consistent. That is by no means an easy task. In most cases, facilities management departments have evolved uniquely within their institutions. Some schools reside almost independent of their surrounding community; others are more interdependent.

MAINTENANCE TYPES

Let's first look at the kinds of activities that many facilities operations perform. Figure 1 is a Venn diagram showing most of the activities, in general terms, of a typical facilities maintenance operation. The large circle represents all maintenance activities the operations and maintenance (O&M) staff may perform in a year. The next smaller circle, entirely within maintenance, is planned work. This includes preventive or predictive maintenance and some corrective work—that which can be scheduled.

Other circles represent emergencies such as power outages and pipe leaks, which cannot be scheduled but are clearly maintenance, and reactive work—those tasks that customers request that have some time requirements associated with them and are not fully within the facilities operation's control to schedule.

Finally, hanging off to the side and trying to be part

of maintenance, is capital work. Many of us don't want to believe it, but some activities performed by maintenance staff clearly add to the remaining life of a building and thus are capital in nature.

Maintenance is also a continuum of activities that range from predicting or preventing failures to capital improvements or renovations, with repairs and "support maintenance" involving operational activities in the middle. The facilities professional must manage resources to meet the needs of the continuum of activities and service the campus. Figure 2 attempts to describe how a typical facilities operation may manage resources along this continuum of activities.

Figure 2 graphs each of the activities identified in the Venn diagram in Figure 1 as a percentage of total resources. If resources are minimal, it is likely that only emergency work can be accomplished. This is representative of APPA Level 5, wherein there are so few people available to perform maintenance work that they are listed in the graph as able to respond only to things such as pipe leaks, heating or air-conditioning failures, and broken windows or locks.

As a facilities operation has more staff (moving to the right on the axis of the graph), it is able to accomplish a greater variety of maintenance activities: planned (predictive/preventive and corrective), emergency, reactive, support, and capital work. When a larger variety of maintenance is completed, the percentage of emergency or critical activities decreases. This occurs naturally even if the number of emergencies remains the same in absolute terms. However, it is likely that if preventive/predictive maintenance work is being done, it has an immediate effect on some of the emergencies (e.g., pipe leaks).

If maintenance is performed in a timely manner, then there will be no or very few unplanned outages that require an emergency response. Examples of these timely interventions include replacing capital equipment at the end of its useful life and scheduling equipment rebuild during off-season times. As more resources are available, the facilities officer is able to assign staff to accomplish a wider variety of work.

Figure 2 does not mandate that work be done. Every facilities professional works with individual definitions based on operating or historical differences at individual institutions. Therefore, each type of task identified in Figures 1 and 2 requires some additional clarification of the differences and fine points. These differences may have little effect on the number of people needed to maintain one campus but a major effect on another. The facilities professional needs discretion to interpret and operate.

Figure 1: Overlaps and Interrelationships in Types of Maintenance

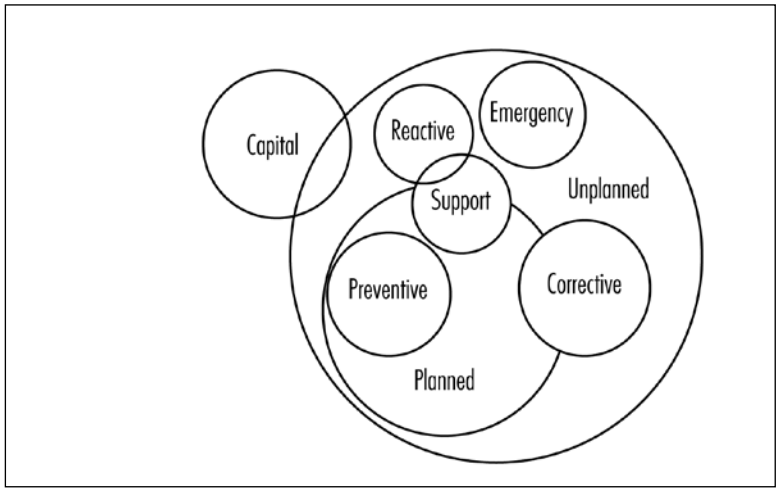
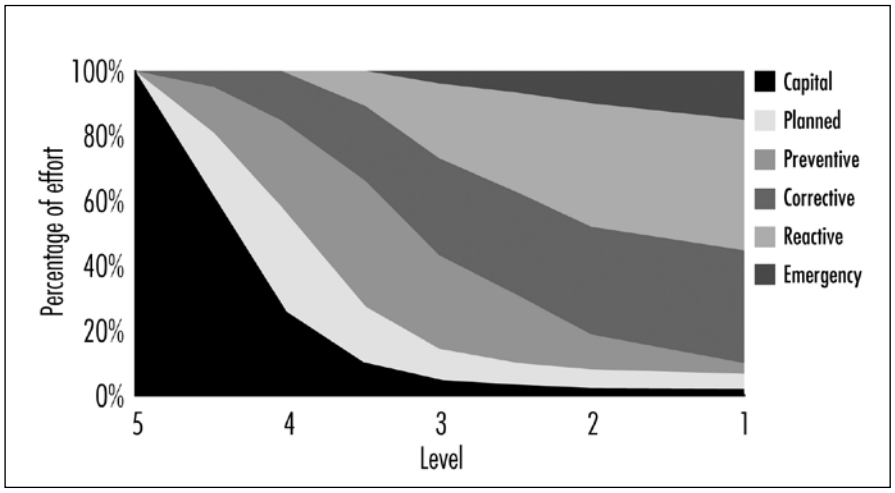


Figure 2: Maintenance Activities as a Percentage of Total Resources



THE QUESTIONS OF MAINTENANCE

So, what are the fine points? What are the major points? Are there examples of the fine and major points? What are the differences between the standard definition of building maintenance and the definition used on your campus? How do the differences affect maintenance trades staffing? How is the budget affected? How is deferred maintenance affected? How can you use this guide to better fund your maintenance budget? What is and is not included in building maintenance?

First, what is not included in building maintenance? Major replacements of equipment or building components that have

reached the end of the anticipated life cycle are not included. A chiller that is 25 to 30 years old and should be replaced, either because it is old or because the amount of annual service it demands is excessive, is not replaced through a maintenance effort. Similarly, a masonry facade that is exhibiting serious water infiltration or has cracks, particularly at corners or in places where expansion joints should have been located, is not a maintenance effort. Both of these projects are considered capital renewal or improvement; they are not annual maintenance. *They both extend the life of the facility, so from an accounting perspective they are capital improvements*. Likewise, custodial activities—cleaning, waxing, washing, and so on—may be maintenance, but they are not considered as trades maintenance in the Maintenance Guidelines publication. Those maintenance activities are discussed in *Operational Guidelines for Educational Facilities: Custodial*. Maintenance activities to the grounds and other exterior features are discussed in *Operational Guidelines for Educational Facilities: Grounds*.

Another category that falls outside the definition of maintenance is improvements (capital), either at the request of a user or because technology has identified a better way of performing a particular function with capital equipment. This category includes the installation of new instructional equipment (movable or fixed) that was not previously present or the installation of energy-efficient light fixtures that have a determinable payback and will assist in financing the project.

A simple description of this category might be, "If it's there and it isn't working correctly, it is maintenance; if it isn't there, it is not maintenance." Individual campuses will differ on these points. One campus participating in our initial data-gathering effort would perform minor improvement work (less than 16 hours and less than $1,000) under the normal maintenance staff and budget; it considers this work more customer-focused service.

Maintenance is not a major project that will extend the life of the component or assembly—that is, it is not life-cycle replacement. Neither is maintenance a project that solely provides for a technical or economic improvement to a facility. While it is easy to list things that are not maintenance, it is more difficult to list things that are maintenance; it is easier to say "no" than to identify how to say "yes." Because this guide is intended to provide answers to the harder questions, the definition of maintenance must be made in a positive way.

TYPICAL MAINTENANCE TASKS

The following are ten illustrative samples of typical tasks expected of the facilities department, followed by the type of maintenance within which the tasks most likely fall.

1. Repair leaking roof and associated damage from storm of July 6 — Capital Maintenance
2. Paint Fine Arts room 105 for new department chair — Support Maintenance
3. Replace broken window in Life Science Building, west entry — Corrective Maintenance
4. Perform eddy current test on chiller in the Physical Science Building — Preventive Maintenance
5. Old Main room 125 is hot — Reactive Maintenance

6. Replace inoperative light fixture in Business College room 2414 — Corrective Maintenance
7. Set up stage and chairs in gymnasium for graduation ceremony, May 6 — Support Maintenance
8. Replace broken exit device at northwest door of Technology Building — Emergency Maintenance
9. Replace door in Education Building; it needs to be a Dutch door now — Support Maintenance
10. Relocate hand-washing sink in food service kitchen to make way for a new oven— Capital Maintenance

Another way of looking at the duties and responsibilities of the maintenance department is to view them within generic operating rules or limitations. These limitations describe the characteristics that make up annual maintenance activities. The characteristics address object, time, and location (what, when, and where). First, maintenance is generally component-nonspecific; it can happen to anything on campus. The maintenance department responds to hundreds of small requests or needs to keep the campus operational. These needs may be the result of vandalism, wear, or general use. For the most part, these requests cannot be planned (other than preventive/predictive maintenance).

Second, the duration of maintenance work (excluding preventive/predictive maintenance) cannot be predicted. Individual maintenance activities may have an identifiable duration that is used to plan where and to what activities workers are to be directed through the day, week, month, and year. However, maintenance does not have an end date or time — it is a continuous activity. Individual tasks will be completed, but the overall effort will go on as long as the campus exists. This is often a difficult concept for different parties to agree on, but it is extremely important to define the scope of maintenance work, particularly if a campus has contracted its maintenance to an outside organization.

Third, maintenance occurs everywhere on campus; it is not limited to a specific site. Individual maintenance tasks may be site-specific, but the overall maintenance activity can occur anywhere. Maintenance personnel are deployed on a 24/7 schedule (depending on priorities and general campus operating rules) to resolve operating issues that affect a wide variety of buildings, equipment, or components.

These three limitations define what constitutes maintenance. The opposite of maintenance is the capital project. A capital project, whether it is a new facility, rehabilitation/renovation, or major repair, is a specific, focused activity. It focuses on a specific piece of equipment or building component, it almost always occurs within a specific time frame that is usually identified and scheduled in advance with a planned completion date, and it occurs in a specific location.

From an accounting perspective, a capital project either increases the value of the campus (e.g., a new building) or extends the useful life of a facility (e.g., a replacement chiller). Some would argue that replacement of an old, large, centrifugal chiller is part of an annual maintenance plan, but the project is specific, of limited duration, and in a fixed location — which means that it is a capital project, not annual maintenance.

It may also be argued that the planned repainting of a building interior is not maintenance, but rather a capital project. It is entirely possible to describe a single effort that is then contracted, executed, and completed without maintenance employees. This is an operating decision for the facilities professional to make. If it is decided that the campus will perform cyclical repainting of building interiors with maintenance forces, then the staffing levels are easily determined by selecting the repaint cycle length. Similar arguments could be made for maintenance efforts to other continuous components, such as masonry, roofing, or flooring. Replacement cycles should be looked at carefully before the choice is made. A replacement cycle may commit the organization to more maintenance work than it can sustain.

STEWARDSHIP AND CUSTOMER SERVICE

As educational facilities professionals, we have a prime obligation to be stewards of these assets and ensure that they provide long-term value. Customer service is a major factor in customer satisfaction. They are not mutually exclusive and, in reality, cannot exist without one another. Our customers expect service with urgency to maintain satisfaction. Without customer satisfaction, a department loses support and likely funding.

Our facilities departments must lead with highly visible customer service, while tracking performance and still allowing the largest portion of our resources to follow with stewardship functions.

An established, published target level of service expectation—one that the campus community understands and supports—is a facilities manager's best tool for achieving the desired balance.

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