

**The Doors to Reliability.**  
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**Three issues and 10 steps on the road to  
long performance life and smooth operation for  
doors and door hardware.**

Managers face three central issues when making door and door hardware decisions: ensuring ADA compliance, monitoring fire ratings, and handling daily wear and tear.

Change is a constant when it comes to doors and hardware materials, specifications and applications. Perhaps the biggest challenge for engineering and maintenance managers is ensuring that facility doors and hardware meet the requirements of regulatory compliance.

Beyond compliance, however, lies performance. Managers in any facility can benefit from an inspection and maintenance program designed to extend reliability and performance life while optimizing demands on resources and keeping costs low.

**ADA requirements**

**The objective of the Americans with Disabilities Act (ADA) is to provide equal access to facilities for all. It has had the positive result of prompting physical plant managers to review their facilities for accessibility, with special emphasis on the needs of those public facilities users with impaired speech, hearing or mobility.**

Automatic doors that meet ANSI standards A117 and ANSI AL56. 19 can be installed in new or existing facilities. Features that enable easy access include:

- adjustable open and close speed
- adjustable time delay
- push-button activation
- a push and go option
- power-assist open feature.

Safety features for doors include:

- an operator that turns off if the door meets an obstruction
- a door that reopens if stopped during close
- a safety scan sensor mounted on the door that reduces contact with the door.

ADA and other compliance issues have challenged managers to find resources to help in monitoring compliance work. Thousands of hours of deferred maintenance have resulted as budgets often lag behind the workload, or low productivity limits the amount of work accomplished. A state-of-the art planning and scheduling system can provide relief for such problems.

**Fire ratings**

**Fire ratings, based on the time it takes for fire to burn through the door, are regulated by law, and**

**they affect owners' insurance costs. All doors have firing rating requirements that determine the materials and construction method used in their manufacture.**

A building's construction plans will contain the design fire ratings of the original components. The physical plant manager must know these requirements so that the proper specifications are used when ordering or making new or replacement doors or hardware.

### **Daily wear and tear**

**The building use and number of users implies a certain level of daily normal wear and tear on doors and door hardware. Main entrances and exits, for example, receive a lot of daily wear and tear. The number of open and close cycles on some high-use buildings can be easily in the hundreds, if not the thousands.**

Repair, adjustment and replacement for these applications will be much higher than for, say, emergency exits that are never used, except to test their operation or during an actual emergency. Frequency of maintenance will be much different in these two cases, even though the doors are very similar in construction and the tasks to maintain them are similar.

### **Ten steps to reliability**

**The following 10-step inspection and maintenance program will help to ensure optimum reliability and long performance life for doors and door hardware, along with high regulatory compliance, when it is used in conjunction with regular, periodic reviews of regulatory changes.**

**Step 1.** Inventory all doors by type and location. If a building is fairly new, the plans and specifications documentation contain this information. If the building is older, some items may have been replaced. Documentation such as type of door, hardware, maintenance requirements, and lubrication and adjustment frequency is needed.

Information for the replaced items may be harder to gather. In some cases, this can be obtained from the manufacturer of the replacement doors or hardware.

**Step 2.** Obtain recommended maintenance procedures. From the documentation, select the recommended preventive inspections, lubrication, adjustment and repair procedures. Also, check for the recommended frequency of service for repetitive tasks, such as inspection, lubrication and adjustment.

**Step 3.** Develop maintenance frequencies and tasks for doors and hardware that do not have documentation. If an item is obsolete, information may no longer be available from the manufacturer. In such cases, tasks can be determined from documentation for similar items. Estimate the frequency to begin with, and adjust it according to experience. If a lot of unscheduled repairs are required between scheduled inspections, lubrications and adjustments, the frequency of these preventive maintenance (PM) tasks probably need to be increased, assuming the PM was done right.

**Step 4.** Assign task frequency and time. Enter each task and the time required to perform it on an annual schedule. Distribute the tasks throughout the year by giving each task an identification number that is entered on the annual schedule calendar on each date it is to be done. For example, a quarterly door closer adjustment may be entered on the annual schedule calendar in January, April, July and October.

**Step 5.** Make the first pass at grouping the tasks into routes. It is a big advantage to group tasks that occur in the same building or area together so they occur at the same schedule time. This grouping can eliminate excess travel time. All of the door and hardware jobs that must be done in an area are done at the same time while the worker is in the area.

**Step 6.** Inspect the calendar for route improvements. The first time the jobs are scheduled, some unevenness may result. Too many jobs for the available resources may occur at some times and not enough at other times. By examining the schedule for this bunching of tasks, a planner can evaluate the distribution and improve it. At the same time, the planner can look for excess distance between tasks.

**Step 7.** Make a second pass at grouping tasks into routes. Redistribute the tasks for more even spacing over time to better use resources, and for better grouping by area to reduce travel time.

**Step 8.** Inspect the calendar for even distribution of tasks by date and location. Re-evaluate the annual schedule after the changes are made to look for more improvement opportunities.

Seasonal considerations are important. Crews don't want to be working on exit doors in mid-winter if the facility is located in a cold climate, unless there is no alternative. If the routine preventive work is done right before the cold season, there is less likelihood repairs will be necessary during cold weather.

**Step 9.** Make initial assignment of door inspection and maintenance routes, and check compliance. The payoff begins when the scheduled tasks are assigned to maintenance people and the work is completed on schedule.

The planning function usually prepares compliance reports for management showing the number of jobs scheduled versus the number completed. Frequency of reporting is daily or weekly. Frequent compliance checks are the key to high compliance. If the compliance is only checked monthly, it often is too late. By then, the reason for non-compliance will be too hard to establish, and corrective action will be very hard to do.

**Step 10.** Follow-up involves updating the system as regulations or building occupancies change. Revisions occur occasionally based on hearings to address public concerns about the regulatory impact. These hearings can result in changes to the established maintenance practices.

If building occupancy or use changes, the number of people entering and leaving will also change, affecting wear and tear on the doors and hardware. Inspection and adjustment frequencies will have to be increased to keep up with the increased traffic.

### **Engineered maintenance standards**

**In Step 6 — assign task frequency and times — the method used to apply times will affect accuracy of the backlog, which is the amount of work to be done. If estimates are used, inaccuracies creep in, due to perpetuating past delays and other problems. The best approach is to use engineered standard times and work-content comparison techniques. Key typical door jobs are planned using engineered standards. Then they are slotted into ranges of time.**

Other jobs can be compared to these key typical jobs — called bench marks. If the work content is similar, the job time will be the same. Time for travel, job preparation, personal rest and minor unavoidable delay are added. With this approach, the accurate measurement of a small fraction of the jobs performed enables the planner to cover all jobs with accurate engineered times.

If the backlog is accurately known, managers can set staffing, plan jobs schedule with better chance of high schedule compliance, and crew performance management can be accomplished. This technique can be used for planning all types of maintenance work.