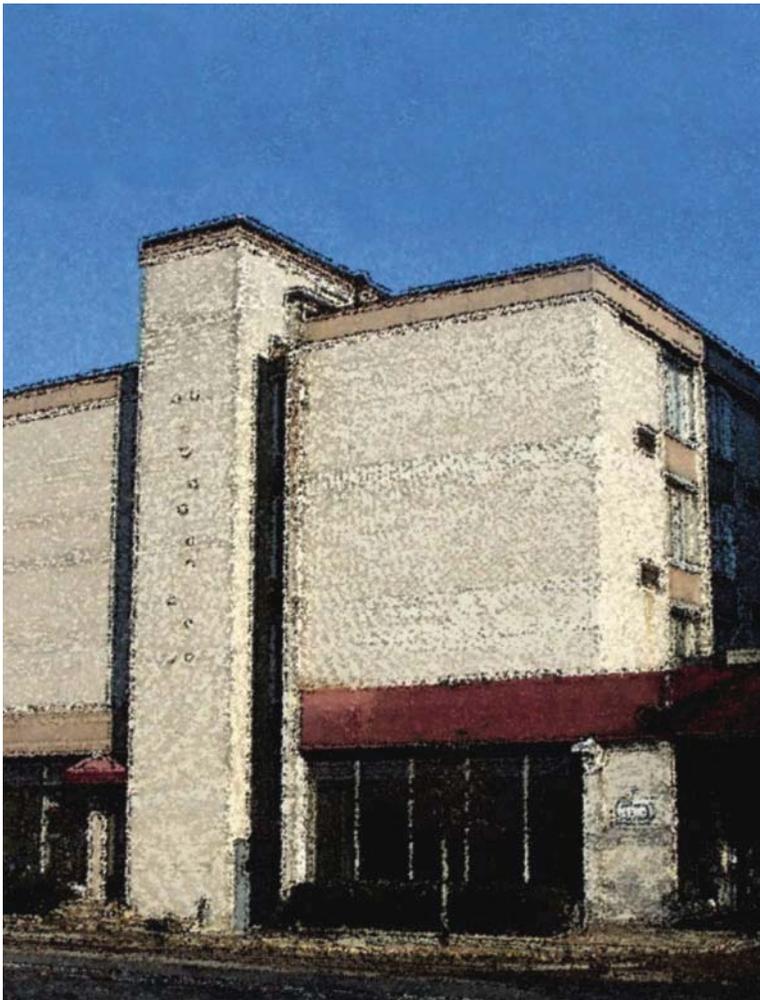


Rebuilding A Maintenance Program:

An Insider's Look at Walter Reed Army Medical Center Building 18

It could happen anywhere, so don't let this happen to you.

By Ricky Smith CMRP, CPMM



EDITOR'S NOTE: A version of this article previously appeared in the February/March 2008 issue of Uptime magazine (www.uptimemagazine.com), copyright 2008 by Reliabilityweb.com.

As a result of negative media attention in 2007, Secretary of Defense Robert Gates formed an investigative team to examine problems at the Walter Reed Army Medical Center. I was proud to serve on a team of professionals that included former Military Surgeons General, lawmakers, and military officers tasked to identify the root problems and the root causes within 30 days. While newspapers and other media outlets went on to focus on other issues with the transition of ill and injured warriors, our team's task was clear: Get to the bottom of the problems now!

What our investigation found was that Building 18 was in ill repair due to sporadic ongoing maintenance and there was a clear need for a structured, supervised preventive maintenance plan moving forward. It's important to note that the problems we found and identified were confined to non-medical facilities (called Garrison facilities), and involved the buildings, such as Building 18, in which outpatients at the facility are housed.

The facility maintenance management system that the U.S. Army developed for its preventive maintenance program was not used properly in the Garrison Facilities at Walter Reed Army Medical Center. Consequently, senior leadership was left blind to the looming maintenance problems.

If you are a senior leader or maintenance manager, you need to ask yourself these three questions:

- What metrics tell me how effective my preventive maintenance (PM) program is?
- Are my assets ranked based on risks to the business?
- Is that ranking used to determine on which assets I must execute PM, on schedule, 100% of the time?

Knowing the answers to these questions will help keep your preventive maintenance program pointed in the right direction. Be sure to keep in mind that, when manpower is short, you cannot accept the risk of ignoring PM in your high-risk assets.

For leaders outside the world of preventive maintenance and reliability engineering, these tasks may not seem very dynamic, and could easily be

overlooked. It is not unusual for leadership to have a lack of understanding of, or a lack of passion for, preventive maintenance. However, if leadership does not give it the right priority, they can expect to discover in their organization what I saw at the Walter Reed Garrison in early spring, 2007.

It was not the first time I have seen such major maintenance issues, and it won't be the last. I have visited hundreds of industrial plants and facilities in situations similar to the Walter Reed Garrison, so I would say to civilian leaders, "Be careful! This could happen to you."

In our report to the Secretary of Defense, the Director of Public Works at Walter Reed stated that, because the rooms in Building 18 were occupied, the maintenance staff did not inspect the rooms routinely and, therefore, standard preventive maintenance checks were not completed. He stated the department did provide maintenance personnel on a 24-hour, seven-days-a-week schedule to "respond to problems."

All facilities managers should track PM labor hours and emergency labor hours, and monitor the trend. If PM labor hours are low and emergency labor hours are high, either your preventive maintenance is not effective or you are not performing PM. It's possible that your people may be going through the actions but not performing them to an acceptable standard.

Next, you need to identify the assets that are taking the most emergency labor hours and make those assets maintainable. You then need to protect them with a sustainable PM program, using what I call the 10% Rule of Preventive Maintenance.

The 10% Rule simply states that a PM regimen is completed within 10% of the regularly scheduled intervals. An example is a PM scheduled to be executed every 30 days must be completed within three days or it is out of compliance.

Two other items must follow this rule.

- A detailed procedure with specifications must be followed on any PM procedure.
- All PMs do not need to follow the 10% Rule, only high risk assets, and these must meet 100% PM Compliance. (PM Compliance is the percent of incidents during which a PM is accomplished on time.)

One problem you will probably find right away is inaccuracy. People may record activities on work orders or service orders without actually having performed those activities. Discipline should be a requirement, not an option.

What has the U.S. Army Done Since February 2007?

It may have taken national headlines to get attention focused where it needed to be, but most of the people I talk to in the military agree that the attention was invaluable. With the Army's leadership focused on the issue, changes began immediately. In fact, a number of changes came about within the first week. Our military has great leaders who are not ashamed to admit when problems occur. However, they will not accept repeat occurrence.

The Walter Reed Building 18 revelations set in motion a series of events that have changed the US Army forever. Let's explore those events from the facilities management and engineering perspective, by examining some significant findings our facilities investigation disclosed.

Basically, the Walter Reed Garrison had a collapse of structured processes, leadership visibility, and, in my opinion, common sense.

Processes That Failed Preventive Maintenance (PM)

The PM program the U.S. Army developed for facilities is based on known failure modes of an asset. The program addresses how and why an asset fails, and mandates preventive maintenance accordingly. This Reliability-Centered Maintenance protocol has withstood the test of time in many Army facilities.

The inspection typically is a time-based program, executed on priority ranking, and looks for the first detection of failure. Inspections examine predictive, detective, or condition-based maintenance, and require strictly disciplined attention, as well as performance, if they are to be successful.

No evidence appeared to demonstrate an effective prioritization process had been established for the Garrison facilities.

Leadership

Potential problems must come to leaders' attention, as a key to success in any organization. This did not happen in the Building 18 event.

Leaders need to have a clear view of how their organizations conduct maintenance. If the captain of the Titanic had seen the iceberg in time, he could have steered around it to avoid disaster. Instead, he didn't know because he couldn't see it.

Leaders need to know if the maintenance process in place actually controls how the facilities are maintained. Therefore, leading metrics, such as PM compliance, schedule compliance, mean time between failure, etc., should be captured, recorded and trended.

Leading metrics help you identify your "bad actors." These are your worst-performing assets, facilities or equipment, as shown in your periodic and spot assessments. Identifying your "bad actors" allows resources to be allocated to the right asset at the right time.

Common Sense

Many times excuses for maintenance failures can be the reason the failures don't get repaired properly. And many times these excuses just don't make sense. Below are some excuses I have heard, and perhaps your organization uses them as well.

- No time for preventive maintenance. High frequencies of emergency repair seem to take your available labor time away from preventive maintenance. To get out of that spiral, you must identify high priority assets first, and restore them to a manageable maintenance routine. Next, apply PM procedures on a disciplined schedule. You will never overcome emergency maintenance burdens until you get preventive maintenance under control.
- Emergency repair frequencies keep going up for no known reason. When you have so many problems that you can't get a handle on them, you must step back and develop a good plan to get them under control. The first step is to track all failures by using a metric called Mean Time Between Failure (MTBF). This metric allows you to focus on the asset that is failing the most. You derive the metric by dividing units of time by the

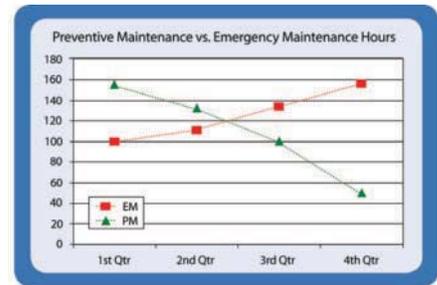


Figure 1 - Example of Emergency Labor Hours going up, Preventive Maintenance Labor Hours going down. This signals a problem.

number of emergency repair sequences occurring during that time. For example, performing three emergency repair sequences in 24 hours gives you a MTBF of eight.

- Not enough money to hire an expert. I once visited a facility where the roof had failed numerous times over several years. During this time, the organization repaired or replaced the ceiling, flooring and walls repeatedly. The maintenance manager explained that the roof was not repaired properly because the maintenance person was not formally trained in roofing, but was the best on staff, and the manager could not afford to hire a roofing company. This statement seemed to ask more questions than it answered, because the cost of repeated ceiling repair and room damage must have far exceeded the cost of hiring a professional to fix the roof right in the first place.
- Not enough maintenance staff. You never will have enough maintenance staff if you do not reduce your emergency repair requirements for failing assets. You also will never control the failures if you don't develop and manage a true PM program.
- Skimping on maintenance is OK because this building/equipment is scheduled for retirement. Are the demands or expectations on a piece of equipment, or a facility, being reduced? If not, they must be maintained to full capability and functionality. One of the main requirements of Reliability Centered Maintenance is for the functional capability of an asset to meet the needs of the user. If the assets or facility do not meet user needs, they have failed functionally. Assets or facilities must be maintained to full functionality until shutting down permanently.

Do any of these sound familiar? Could a breakdown in any of your processes, leadership, or managers' application of common sense create a failure in your maintenance program? One of the best solutions is to educate your leaders in the value of maintenance and reliability.

What Did the U.S. Army Do to Correct the Garrison Facility Issue?

The U.S. Army Medical Command acted swiftly, while awaiting reports from outside agencies.

It took immediate corrective action. Here's a short list. →



Figure 2 - Stair Tread Problem, a tripping Hazard (courtesy US Army)



Figure 3 - Water Leak in a Garrison Facility at Walter Reed (courtesy US Army)



Figure 4 - Major Steam Leak in Basement Area of Garrison Facility (courtesy US Army)



Figure 5 - One of the Barracks Facilities at Walter Reed Army Medical Center (courtesy US Army)

Immediate Actions

- Conducted an immediate Facility Condition Assessment of all Garrison facilities at the Walter Reed Army Medical Center Complex. This was contracted to the U.S. Army Corps of Engineers.
- Established a clear line of command and control,

and responsibility regarding maintenance of the non-medical treatment facilities.

- Assigned an experienced facilities engineer to oversee Garrison maintenance requirements.
- Established a rapid response team to ensure maintenance issues in housing areas were resolved quickly, no matter what the time of day.

Intermediate Actions

- Examined maintenance and construction funding, re-prioritizing where necessary, to ensure wounded, ill and injured soldiers and their families would be accommodated according to their needs.
- Facility deficiencies at Walter Reed Garrison received corrective action to repair or replace broken, insufficient or substandard components such as walls, ceilings, plumbing or fixtures.
- Wounded, ill and injured soldiers received priority consideration to occupy available housing.
- Garrison housing managers assigned wounded, ill and injured soldiers and families to the best available housing units on the military installation, with the closest proximity to the medical treatment facility.
- Standardized PM checklist to ensure checklist meets the requirements of maintaining the facilities to standard.
- Leadership was instructed to inspect their facilities weekly and report the status weekly to their higher chain of command.

Ongoing Steps for Continuous Improvement

- Perform maintenance and reliability process assessments at six U.S. Army Medical Treatment Facilities to ensure these facilities use the best practices to maintain their facilities to the highest standards.
- Design a new maintenance and reliability process that meets the future facility needs of the U.S. Army Medical Command, where assessment identifies a gap.
- Develop viable leading and lagging metrics, and dashboards, to be used by all levels of military leadership, to measure and monitor maintenance and reliability issues at facilities.
- Implement a training and certification program for maintenance leaders at all Army Medical Treatment Facilities. This training and certification will become the standard for contractors and U.S. Army personnel.
- Develop a system to collect and analyze feedback from wounded, ill and injured soldiers, their families, physicians, nurses and other key staff, as part of the preventive maintenance program.
- Ensure new facilities are designed and constructed to meet the needs of the Army's wounded, ill and injured soldiers, and their families.

- Launch a new software package to help support facilities management, including tracking the type of outpatient assigned to a specific type of room (Americans With Disabilities Act), if preventive maintenance was performed on time, outstanding work orders on rooms, etc.
- Implement new maintenance and reliability processes throughout the U.S. Army Medical Command world wide if, during the assessment, any gaps are found in the current maintenance and reliability process.

Summary of Recommendations

No matter how large it is or how strong its leadership, no organization is immune to serious maintenance problems, which have the potential to create controversy or major financial loss. In other words, what happened at the Walter Reed Garrison facilities could happen to any organization. To ensure this does not happen to your organization, follow some of the simple recommendations detailed in this article:

- Ensure metrics are in place to verify your organization's preventive maintenance program is working. Just a few recommendations: (a) Track PM labor compared to emergency labor hours, (b) Track mean time between failure, and (c) Walk through your facility or plant to make sure what your metrics show is what you see with your eyes.
- Inspect your preventive maintenance procedures and ensure they have specifications, steps, procedures, and time standards clearly delineated. Use checklists. If a maintenance person tells you they don't need checklists, they are telling you they have an unlimited and an infallible memory, which is not possible.
- Rank your assets and/or facilities based on risk to your business or organization. Ensure your high-risk assets have 100% PM compliance using the 10% Rule of Preventive Maintenance.
- Attend training on asset reliability, which discusses both preventive maintenance and reliability-centered maintenance in the same program. Reliability Centered Maintenance methodology is where all true preventive maintenance programs are developed, focusing on failure modes and risk associated with them. **FEJ**

Ricky Smith, CPMM, CMRP, a retired U.S. Army major, is senior technical advisor at GPAllied (www.gpallied.com) of North Charleston, South Carolina. He has spent most of his life as a U.S. Army Reservist, a maintenance professional in maintenance management, and as a reliability consultant in private industry where his skills and knowledge from each area have served him well. He developed his skills and experience while serving as a maintenance company commander in support of Operation Iraqi Freedom in Iraq and Kuwait, and consulting with large corporations in their reliability initiatives to save jobs and lives. He is the author of such books as "Lean Maintenance," "Rules of Thumb for Maintenance and Reliability Engineers" and "Industrial Machinery Repair – Best Maintenance Practices Pocket Guide."