Could this prescription to optimize work flow, compliance and productivity help improve the well-being of your maintenance organization?

If you think the challenges of running an efficient maintenance department that is praised by staff members and top management are insurmountable, think again. With management commitment, efficient planning and scheduling and effective use of technology, Aurora St. Luke's Medical Center is a stellar example of how it's done.

St. Luke's, located in Milwaukee, WI, is internationally recognized for cutting-edge treatment technologies and exceptional physician specialists. The hospital's 41 maintenance technicians support the main 938-bed hospital spread over a campus of 2 million+ square feet, along with several outlying locations. (St. Luke's is part of Aurora Health Care's vast regional network of hospitals and healthcare providers—*a network that includes 15 hospitals and 200+ clinics.*)

The responsibility of maintaining a world-class healthcare facility requires the help of an effective computerized maintenance management software (CMMS) system. Several years ago, Nolan Harp, Senior Director of Facilities Operations at Aurora, recognized that the facilities' existing software was inefficient and presented ongoing problems. In 2005, Aurora contracted PEAK Industrial Solutions to assist with selecting and implementing a new Web-based solution.

Six years of careful facilitation planning and upgrades have yielded a number of positive results.

While managers often recognize a problem, committing to a solution and following through are not as common. Harp's determination to make enterprise-wide improvements (with the St. Luke's facility chosen as a pilot) and adopt new technology and automation have resulted in reduced operating costs and significantly higher productivity of the maintenance technicians. The plan is to have complete enterprise-wide implementation by the end of 2012.

A successful CMMS system is a tool that goes far beyond record keeping. A fully utilized CMMS offers maintenance operations opportunities to save both time and money. The problem, according to various studies, is that 60-80% of CMMS implementations fail. Putting it simply, if the implementation project isn't handled right from the start, the organization won't realize a return on its investment.

Prescription for success

Basics first, then technology…

One of the most important points to keep in mind is this: You can acquire the best CMMS and mobile technology, but it won't help improve productivity until the "basics" are in place. The fundamentals of maintenance management are the work process flow, planning and scheduling, parts-inventory control, etc. If you don't have the basics in place, no amount of technology can help.

Once you determine the appropriate process flow and planning requirements for your operations, the right technology can help you tremendously. The trick is to make sure your CMMS supports your process flow, planning and scheduling model.

PEAK identified a process-flow study as the first step in a St. Luke's CMMS implementation. This study indicated several opportunities to improve planning and scheduling and revealed the many benefits of implementing mobile CMMS for Aurora Health Care. St. Luke's mobile fire-extinguisher inspection program was chosen to help prove the model.

Planning and scheduling…

After determining a good process flow, the planning and scheduling process can start. Many people believe that developing a planning and scheduling system for a maintenance department is a complicated task. It doesn't have to be: Consider the usual process we follow in completing routine tasks outside work. For example, when we start a home-improvement project to replace kitchen tiles, we don't immediately start pulling tiles off the wall. Instead, we think through the steps to complete the project, choose the best materials and plan for replacement parts. Next, we identify tools to remove the old tiles and account for drying time in the schedule. Maintenance jobs involve the same considerations.

In many operations, the focus of a maintenance technician's job is to fight fires that come in the form of urgent work orders. Without effective planning, time is wasted because priorities are not set and needed parts are not available. When technicians are sent to complete work orders without proper planning and scheduling, they—*and the requesters*—are frustrated by miscues, wasted time (looking for parts, unnecessary travel, etc.) and incomplete repairs. In the end, the maintenance supervisor is led to believe that more technicians are necessary. That's not necessarily correct.

In most cases, it is inefficient work flow that leads to low labor productivity. Look at it this way: If you had a crew of 50 technicians and improved their productivity by 20%, it would be like "hiring" 10 new technicians. The area of planning and scheduling is so important to your organization that a work order shouldn't be released until those phases are complete.

Parts-inventory control…

A planning and scheduling system, in turn, is not complete without establishing effective parts management. To ensure parts are available when work orders come in, the following steps must be taken:

- Add a parts list to each piece of equipment. Technicians won't waste time looking up part numbers and corresponding vendors.
- Instruct technicians to record substitute parts when they discover them. That information can save another technician significant time later on.
- Review frequently used parts and delete obsolete items.

Dealing with work orders

Successful planning and scheduling is based on how work orders come into the maintenance department—*and how they are handled.* At St. Luke's, most new work orders were arriving by

phone. With more than 5000 work orders per month, that meant significant staff time was devoted just to answering calls. In addition, it was easy for details to be lost when orders were delivered verbally.

As a result of the process-flow study, it was determined that increasing the number of work orders arriving electronically, rather than by phone, would save time and reduce requester frustration. Electronically submitted work orders would limit communication problems, because the requester's exact words would be recorded for easy reference by technicians.

An objective classification system is necessary to schedule work orders appropriately. PEAK supplied the following prioritization model, and St. Luke's maintenance group adapted to their operations:

- P1 = Urgent *(Interrupt existing work.)*
- P2 = Important *(Reschedule after finishing current assignment.)*
- P3 = *(Complete within 3 days.)*
- P4 = *(Complete within 7 days.)*

It's important to keep the priority ratings to a few categories. Too many priority ratings are just not practical.

Defining roles

St. Luke's recognized that a central gatekeeper—*or planner*—needed to make decisions regarding work orders. The HVAC planner spends between one and two hours per day on planning and scheduling and the rest of the workday on actually performing maintenance tasks. The following duties were assigned to the HVAC planner:

- Make scheduling decisions based on preliminary investigations.
- Group work orders for one building or location.
- Confirm availability of parts for the job.
- Determine availability of work areas and/or equipment.
- Limit interruptions to individual technician's work by assigning urgent requests only to dedicated or pre-assigned technicians. At any given time, no more than 10% of technicians should be allocated to urgent jobs. The other 90% of the maintenance staff should be working on planned jobs and preventive maintenance (PM).
- Order parts.

- Review and revise PM procedures.
- Participate in continuous improvement of work orders and the planning and scheduling process.

The Role of the Planner

• Identifies parts needed for a work order, checks availability and records them in the CMMS system…

• Identifies special tools necessary for the job, checks availability and records that information in the CI

• Attaches prints, drawings and instructions to the electronic work order…

• Checks when the equipment or asset to be serviced will be available…

• Assigns technician

Staying on task with PM

Urgent requests often dominate technicians' attentions. As a result, preventive maintenance becomes a low priority and equipment condition deteriorates. In the end, technicians spend more time repairing equipment that would have been in working order if PM schedules had been followed all along. Thus, an effective planning and scheduling process pays great attention to ensuring that PM is completed on schedule.

To ensure regular PM, St. Luke's predetermines the amount of time needed to complete the work and the parts necessary. The planner adjusts planning information as technicians complete work orders and report data.

The process-flow study discovered that releasing PM work orders on a weekly basis delivered better results than doing so on a monthly basis. When technicians received a smaller number of work orders at a time, it was less overwhelming and psychologically easier for them to handle. Planners would still develop a monthly PM work-order schedule—*but the work orders would be released in weekly increments.*

Benefits of proper planning and scheduling

In addition to the cost savings in time and manpower, St. Luke's realized other benefits of proper planning and scheduling. According to Doug Bertram (HVAC Planner), PMs are now completed on time. That extends equipment longevity and ensures the meeting of compliance requirements.

Another benefit is that planners can assign jobs based on a technician's location. That's especially helpful on a large campus where it may take a technician 20 or 30 minutes to report back to the maintenance department to receive the next assignment. Finally, Bertram notes that planning and scheduling reduced HVAC backlog.

Now that the HVAC Maintenance Department planning and scheduling prototype is in place, other Aurora Health Care locations are considering implementation. They can take the successful HVAC example from St. Luke's and adapt it to fit their own departments' processes and needs.

The next wave of CMMS: going mobile

Mobile technology solutions add another layer of efficiency to CMMS systems. They allow technicians to collect performance data (readings and routes), offer a paperless environment and provide efficient ways to track parts inventory.

Aurora Health Care has recognized that using handheld mobile devices to inspect fire extinguishers distributed throughout its sprawling facilities can improve efficiency, compliance and reporting. Keeping up with National Fire Protection Association (NFPA) requirements and local fire-department inspections can be a daunting task—*particularly with a paper-based system*. Fire extinguishers have to be in place and in good working order. Inspection and maintenance records for each extinguisher must be readily available for surveyors to see.

In the initial stages of this pilot CMMS project, it was discovered that there were two critical aspects associated with every fire extinguisher: appropriate location and type of fire extinguisher. In large facilities like St. Luke's, a major challenge is keeping track of this life-saving equipment in the event that it's moved from one location to another. For example, a defective extinguisher may be swapped with one nearby. Or someone might think an extinguisher is needed in a certain spot and move it without recording that fact. Those changes need to be documented and missing equipment replaced.

With the assistance of PEAK, St. Luke's implemented a CMMS mobile system that identifies each fire extinguisher as a piece of equipment—*and records each unit at its specific location.*

Snapshot of a Mobile Fire Extinguisher Maintenance Program

Aurora St. Luke's mobile fire extinguisher maintenance program includes the fol

- *Ability to track 700 fire extinguishers throughout the facility*
- *Quick notification of missing fire extinguishers*
- *Reliable documentation of fire extinguisher inspection and maintenance*
- *Real-time reporting capabilities that allow staff members to see completed and pending inspections at*
- *Assurance that security officers are inputting information correctly through guidance from the mobile sy*

How the mobile system works…

The system tracks fire extinguishers with bar codes on both fire extinguishers and mount

locations. At St. Luke's, security officers from the Loss Prevention Department are responsible for fire-extinguisher inspections. Each inspection includes a check to ensure the fire-extinguisher location and type are correct and whether each inspection passed or failed.

On an ongoing basis, every fire-extinguisher location—*along with the name of the officer who inspected it*—is recorded. When the equipment isn't in its expected location, it can be replaced quickly. Then, Plant Operations can follow up on why the equipment was missing or moved.

The mobile CMMS tracking system allows facility officials to view, at a glance, the location and inspection for any of their 700 fire extinguishers. Maintenance managers can email periodic reports to monitor progress on inspections as the month proceeds. If problems arise, they can be fixed before fire-prevention officials visit for an audit.

This system also instills a higher level of confidence regarding the performance of inspection and maintenance activities related to the fire extinguishers. Now St. Luke's can identify where its 700 fire extinguishers are at any time. The equipment is inspected every month without the tedious task of recording information on paper tags (a process that could lend itself to falsification of records should a technician write the incorrect inspection date on a tag or, worse, document in writing an inspection that never occurred). The mobile system meets compliance requirements and is accepted by fire marshals.

(Author's Note: Success of the program would not have been possible without the support of John Dobrzynski, Supervisor of Security and Loss Prevention. His willingness to accept Plant Operations' recommendations is credited with the successful implementation and security officer buy-in to use the mobile devices properly.)

The right protocol pays off

Aurora Health Care's CMMS system implementation, piloted at St. Luke's, has been successful because of strong support and commitment from management. In fact, management's enthusiasm is as high now as when the project began several years ago.

The CMMS system continues to generate data that allows management to make meaningful

decisions. Today, the results from the HVAC Department's planning and scheduling improvements are driving management to implement the same process throughout Aurora's other facilities. With its mobile fire-extinguisher inspection process, St. Luke's is confident that its equipment is in compliance with federal and local fire codes.

Another major benefit is that Plant Operations staff members spend less time preparing for required inspections by the fire marshal and other entities. With data and reports available at their fingertips, personnel can respond to inspectors' questions quickly. That's a better way—a very healthy way—*for any operation to do business*. **MT**

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