



Preventative maintenance

KT1601 Purpose of preventive maintenance

Preventive maintenance (PM) is the regular and routine maintenance of equipment and assets in order to keep them running and prevent any costly unplanned downtime from unexpected equipment failure.

A successful maintenance strategy requires planning and scheduling maintenance of equipment before a problem occurs. A good preventive maintenance plan also involves keeping records of past inspections and the servicing of equipment.

Because of the complexity of maintaining a preventive maintenance schedule for a large amount of equipment, many companies use preventive maintenance software to organise their required preventive maintenance tasks.

What are the Types of Preventive Maintenance?

PM is used to anticipate and prevent the breakdown of equipment and should ideally be performed on all items of equipment to prevent age-related failure. Manufacturers often provide recommendations to maintain a piece of equipment but, generally speaking, there are three main types of preventive maintenance task:

Mandatory / Non-Mandatory Tasks

Mandatory tasks are those that must be performed as soon as they are due and will often include safety-critical checks. Non-mandatory tasks are still important, but can be delayed without resulting in a critical failure or performance reduction. A preventive maintenance checklist should split tasks into mandatory or non-mandatory.

Pyramiding / Non-Pyramiding Tasks

Pyramiding tasks occur when maintenance is set for a due date but is not completed and overlaps with a later scheduled maintenance. In this instance, should a new PM task become due, the previous one is cancelled. A cancellation should include a note to explain this and the new task should include the original due date to monitor how overdue the

task is. Some companies prefer a non-pyramiding structure, which removes the need to note the original missed task and just takes the new date as the baseline.

Inspection and Task Oriented Tasks

Inspection tasks require checks to be made before the results are turned into work orders for planned maintenance to fix any problems that have been discovered. Task oriented PMs allow for minor repairs and adjustments to be made at the time of inspection, reducing the amount of work that needs to be written up as work orders on the inspection sheet.

When is Preventive Maintenance Required?

The exact requirement for preventive maintenance will vary depending on the equipment and the operation it is performing. Industry uses standards to help determine schedules for maintenance so that assets do not run to failure. These guidelines will also cover the type of inspection or maintenance that is needed.

Ideally, by following guidelines set down by manufacturers or standards, a PM schedule should ensure proactive maintenance rather than having to resort to reactive maintenance when something has already begun to fail.

Following this type of predictive maintenance schedule, through tasks such as condition monitoring, requires accurate recording of inspections and servicing against an understanding of the lifespan of a particular piece of equipment. These records will help determine when preventive maintenance is required.

KT1602 Benefits

Advantages of Preventive Maintenance

Less equipment downtime.

Fewer interruptions to critical operations.

Longer asset life.

Improved efficiency (assets in good repair tend to operate better)

Increased workplace safety and improved compliance with OSHA.

KT1603 Prevent data loss

How to prevent data loss

Nobody likes to hear the words "I told you so," especially when they're busy trying to recover from a serious data loss.

Here are some tips to help you avoid hearing them:

Regularly schedule "fire drills" to restore information from backup. They are a necessity, not a frill. If you currently have no drill system, or it has gotten rusty, it's only fair to notify everyone involved that "no-excuse" exercises are on the way. It sounds easy, but it can be a tall order, because a lot can go wrong along the chain of events needed to perform a complete backup and restore.

Keep computers in safe, dry and dust-free areas. Low-traffic locations are best to prevent physical damage to the computers.

Back up data regularly. Then verify the backups by actually getting the data off the tape and back into the computers.

Have a generator or battery back-up system. Large power surges can destroy computer equipment, but even relatively low-level bursts of energy can erase the data on hard drives. Uninterrupted power supplies give protection during lightning and electrical storms so data can be saved or backed up during an outage.

Protect equipment from static electricity that can erase data or damage components. Today's storage media is becoming more vulnerable to extraneous static discharge.

Use virus-detection protection programs and keep them updated. Viruses may not be as common as the news media makes them seem, but they do exist and they can be deadly to data. Use virus-detection protection programs and keep them updated.

Use the "undo" feature. Many installation and diagnostic programs offer undo disks that can restore systems to their original configurations if things go wrong. It's good practice to take advantage of this feature.

There are also software programs that can detect impending problems within hard drives. Using them regularly can head off problems.

KT1604 Improve performance

Tips for Improving Preventive Maintenance with EAM/CMMS Software

[HYPERLINK "https://www.dpsi.com/wp-content/uploads/improve-preventive-maintenance-1.jpg"](https://www.dpsi.com/wp-content/uploads/improve-preventive-maintenance-1.jpg)

Any maintenance manager at a manufacturing plant or facility is likely aware of the problems caused by faulty equipment. Even if just one piece of equipment out of thousands breaks down, it could cause your entire operation to come to a halt. Preventive maintenance involves scheduling various maintenance activities to keep your equipment in peak condition and prevent breakdowns and failure. EAM/CMMS software is an essential tool for scheduling preventive maintenance and monitoring performance. The following are 5 tips to improve preventive maintenance with maintenance management software.

1. Establish standards

In order to develop an effective maintenance management plan, it's important to outline detailed [preventive maintenance](#) procedures and schedules as well as establish standards for measuring performance and improving efficiency. Standard preventive maintenance lists and charts that your software vendor provides should only be used as a guideline to start. You must develop a preventive maintenance process that is unique to your organization.

2. Get all stakeholders involved

EAM/[CMMS software](#) alone will not improve preventive maintenance programs. In order to achieve an effective maintenance management process, you must refine the software to fit your process and get stakeholders involved to ensure that the software meets everyone's needs.

3. Evaluate your current strengths and weaknesses

Prior to implementing new maintenance software, evaluate your current preventive maintenance plan's strengths and weaknesses to determine what your organization's most pressing needs are. Factors to consider include preventive maintenance and work procedures, equipment history, inventory, and maintenance costs.

4. Create a detailed preventive maintenance checklist

A preventive maintenance checklist consists of step-by-step instructions for maintenance technicians to follow when completing a preventive maintenance job. A comprehensive preventive maintenance checklist also shows what preventive maintenance work was performed on a given asset and allows maintenance technicians to provide feedback to the planner and supervisor. The feedback that maintenance technicians provide on a preventive maintenance checklist is valuable and can help improve future work orders.

5. Fine-tune your preventive maintenance schedule

EAM/CMMS software generates automated reminders and preventive maintenance [work orders](#). However, it can be challenging for maintenance technicians to balance preventive maintenance work orders on a combination of assets that includes new equipment and old, poorly running equipment. Maintenance technicians are more likely to ignore new equipment since it's running smoothly and focus on fixing older equipment instead.

It's acceptable to skip preventive maintenance tasks for new equipment that's showing no signs of problems, but maintenance technicians should continue monitoring the performance of the equipment regardless. You may eventually need to resume a more regular preventive maintenance schedule for that piece of equipment.

KT1605 Preventive tasks: e.g. Updating virus and malware detectors, backing up data, defragmenting drives, etc.

Common Causes of Data Loss

Data loss can be caused by many different factors, and each poses a unique problem for data recovery. Hard drive crashes account for the highest percentage of data loss, but human errors and issues with software follow closely behind. [According to data from Kroll Ontrack](#):

1. Human Error

Humans are not infallible — we all make mistakes and sometimes they're big ones. For businesses, these mistakes can result in the unintentional deletion of data files or sections of text. Without realizing it, employees can overwrite important files or delete information that is essential to your business. Human error can also play a role in many other main causes of data loss, including hard drive damage, liquid spills, software corruption and hard drive formatting.

One important measure to prevent human error in data handling is proper training. Ensure your employees understand how data processing within your company works and how your backup systems function. This can be as simple as knowing if the documents they are working with will be backed up automatically or if they must manually save files while they are working.

Mistakes from human error can also be minimized through several software means. Automation minimizes the amount of human interaction with data, which reduces the risk

of deletion or overwriting. An optimized workflow will also leave little room for human error to occur while saving employees time and making mistakes easier to spot. Backup systems should also be used to preserve previous data states.

Recovering accidentally deleted or overwritten data can sometimes be as simple as searching through the computer's Recycle Bin. Other times, you may be able to access previously saved versions of a document. When lost data is not as easy to retrieve, [file recovery software](#) can be a great tool. File recovery software scans your computer's hard drive to identify and restore lost data.

2. Viruses and Malware

Most people think of viruses when you ask them what causes data losses. For businesses, viruses can steal and delete swaths of data or bring business operations to a crawl, destroying company functionality. A computer often gets a virus from an email-based attack or through phishing that tempts an employee to click on a corrupted link. This link then allows the virus or malware to enter the computer system to damage or steal files.

Guard against malware with appropriate anti-virus software. Keep your anti-virus systems constantly updated and regularly run scans to catch viruses before they can do any serious damage. Just in case a malicious program wrecks your data, be sure to make regular system backups as well. Often backed up data is the only way to recover lost data from malware or viruses.

3. Hard Drive Damage

The majority of data losses occur due to hardware malfunctions, with the primary perpetrator being the hard drive. Hard drives are the most fragile parts of computers, and around 140 thousand hard drives crash every week. Of these crashes, 60 percent are due to mechanical issues and 40 percent are a result of human misuse or mishandling, including dropping or jostling a computer or laptop. Hard drives can also be damaged if a computer overheats, typically caused by overuse or a build-up of dust in the computer.

However, as with any machine, a hard drive will wear out over time and will eventually stop working. Below are some signs to watch out for that indicate a hard drive may be failing:

The hard drive frequently crashes

The computer is unusually hot

The hard drive experiences issues while booting up

Processing speeds continually slow

The computer freezes frequently

The computer makes clicking or grinding noises

Files will not open or become corrupted randomly

To prevent hard drive malfunctions, be sure to work with your device appropriately and keep your computer away from excessive dust. You can also ensure that a random malfunction doesn't destroy your data by regularly backing up your hard drive on an external drive or cloud server.

SSDs or [solid state drives](#) are also emerging as an alternative to traditional HDDs or hard disk drives. SSDs do not have any moving parts, so they are more durable for handling than HDDs. SSDs are also less likely to malfunction or crash, meaning you are less likely to lose data. However, computers with solid state drives also tend to be more expensive than those with standard hard drives and may not be financially feasible for every business. Taking preventative measures to protect your computer's data is essential regardless of the type of hard drive it has.

You may be able to recover lost data from a hard drive damage by removing the hard drive from the computer and connecting it to another computer to see if any files are not damaged. If the hard drive is entirely corrupted, you can try to retrieve data using data recovery software. However, it is often best to contact a professional to help you recover data lost from a crashed hard drive.

4. Power Outages

Power outages can interrupt business operations substantially, shutting software systems down without warning. Not only can this result in the loss of unsaved data, but it can also cause existing files to be corrupted due to improper shutdown procedures. Sometimes, entire programs may be rendered non-functional by a poorly timed power outage. If a computer shuts down while it is writing to the hard drive system, it may never start up again.

Even if you do not lose data during a power outage, the improper shutdowns can have lasting impacts on computer hard drives. If power outages or surges happen frequently, the lifespan of a hard drive will be greatly reduced and it will be more likely to crash.

The best way to protect against these problems is by making regular, automatic system backups. Backups are often the only way to recover lost data from a power outage. Your business should also use surge protectors to help prevent possible damage from power

surges. Having a generator or backup battery system can also allow you to save or back up business data during a power outage.

5. Computer or Laptop Theft

In the modern workplace, more and more people are becoming mobile. This often means they are working from laptops or smartphones rather than PCs. Laptop theft is a serious risk and can happen anywhere if a laptop is left unattended. [According to a study:](#)

25 percent of IT theft occurs in cars or other transportation vehicles

23 percent takes place in the office

15 percent happens in airports or hotels

12 percent occurs in restaurants

On top of losing data, laptop theft also poses the threat of a data breach. If employees in your company store or access sensitive information on portable devices, you should have a means of remotely wiping data from those laptops or tablets. You should also ensure that crucial data stored on laptops is backed up to a safe location.

For computers in your office building, ensure that they are kept in locked rooms that only employees authorized to use them have access to. When closing your business overnight, be sure to have a secure lock-up procedure so that you do not invite thieves to steal computers or other valuables.

Internal Assessment Criteria and Weight

- IAC1601 The importance of preventative maintenance is justified
- IAC1602 The purpose and benefits of preventative maintenance is explained
- IAC1603 Preventative procedures are explained

(Weight 2%)

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