Noisy Garage

- **Diagnosing Noisy Garage Door Operation**

Diagnosing Noisy Garage Door Operation **Fixing Doors That Ride Off Track** **Resolving Sensor Misalignment Errors** **Interpreting Opener LED Blink Codes** **Addressing Slow or Jerky Door Movement** **Eliminating Mid Travel Door Reversal** **Quieting Squeaky Rollers with Proper Lubrication** **Identifying Cable Fraying and Safety Risks** **Correcting Uneven Door Closing Gaps** **Resetting Remote Controls After Power Outage** **Detecting Spring Fatigue Before Failure Occurs** **Choosing When to Call a Professional for Repairs**

- **Setting Up Z Wave Connectivity for Your Garage Door**

Setting Up Z Wave Connectivity for Your Garage Door **Linking Garage Doors to Apple HomeKit Scenes** **Voice Control Tips with Google Home Assistants** **Using Amazon Alexa Routines for Door Automation** **Security Considerations for Cloud Based Door Access** **Updating Firmware on Smart Garage Controllers** **Troubleshooting WiFi Signal Issues in the Garage** **Integrating Door Status into Home Security Dashboards** **Battery Backup Management for Connected Openers** **IFTTT Recipes to Automate Garage Door Functions** **Data Privacy Practices for Smart Garage Devices** **Future Trends in Connected Garage Door Technology**

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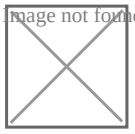
accidents and ensuring longevity of equipment.

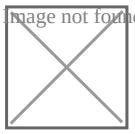
Firstly, identifying cable fraying requires a keen eye and some basic knowledge of what healthy versus compromised cables look like. Fraying typically manifests as exposed wires where the protective insulation has worn away or been damaged. This might look like strands of wire protruding from the cables surface or the insulation itself appearing cracked or peeled. One common sign is discoloration; if a cable that was once uniformly colored now shows patches of different hues or brightness, this could indicate internal damage affecting the outer layer.

To spot these issues effectively, regular inspections are necessary. In an office setting, for instance, this might involve checking under desks where power strips and computer cables often lie hidden from daily view but are subject to foot traffic or chair movement. At home, one should pay particular attention to extension cords that might be stretched across rooms or outdoor cables used for garden lighting or tools.



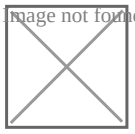
The safety risks associated with frayed cables are significant. The most immediate danger is electrical shock which can occur when exposed wires come into contact with skin or conductive materials like metal objects. This risk escalates in damp conditions where water can conduct electricity more efficiently. Beyond personal injury, theres also the risk of fire; frayed wires can overheat or spark if theyre carrying current through a compromised section of insulation.

Moreover, in environments where data integrity is crucial-think hospitals with life-critical equipment or businesses reliant on uninterrupted IT services-cable damage can lead to data loss or system failures which have their own set of safety implications.



Addressing these risks involves several proactive steps:

1. **Immediate Action**: Once fraying is identified, the cable should be disconnected from its power source immediately if its safe to do so without causing further damage. Never attempt to use a frayed cable until it has been repaired or replaced.



2. **Repair vs Replace**: Minor fraying might be repairable with electrical tape designed for such purposes as a quick fix until professional repair can be arranged. However, significant damage usually necessitates replacement due to potential underlying issues not visible on the surface.

3. **Professional Assessment**: For critical systems or when in doubt about the extent of damage, consulting with a professional electrician is advisable. They can assess not just the visible damage but also check for any electrical faults that might have developed.

4. **Preventive Measures**: Prevention is better than cure; managing how cables are routed (using cable management solutions), avoiding over-stretching them during use, and keeping them away from high-traffic areas can significantly reduce wear and tear.

5. **Education**: Educating everyone in an environment about these risks promotes a culture of vigilance regarding electrical safety. Simple practices like not overloading outlets with multiple extension cords and ensuring appliances are unplugged when not in use contribute to overall safety.

In conclusion, while cables are ubiquitous and often overlooked until they fail, regular monitoring for signs of fraying alongside understanding the inherent dangers they pose when compromised ensures safer environments for all users. By adopting routine checks and swift action upon discovering damage, we mitigate both immediate hazards like electric shocks and fires as well as long-term issues related to operational continuity in our increasingly connected world.

Quieting Squeaky Rollers with Proper Lubrication

About Keypad

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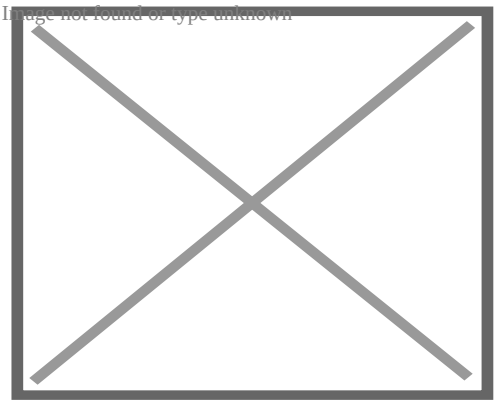

A telephone keypad using the ITU E.161 standard.

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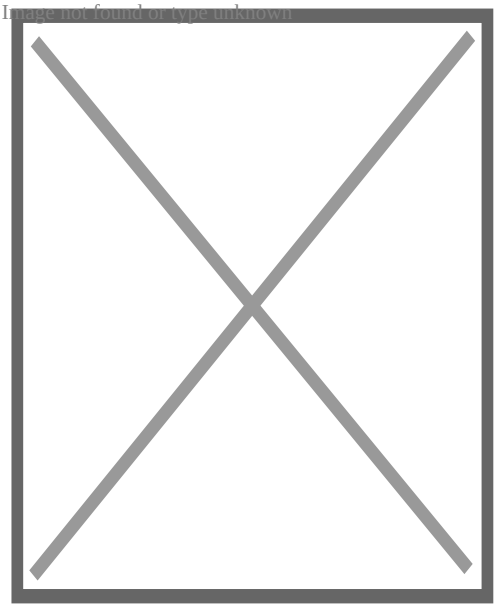

Numeric keypad, integrated with a computer keyboard

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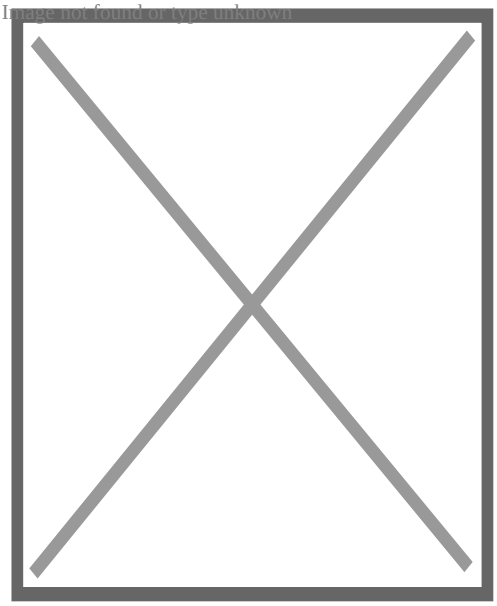

A calculator

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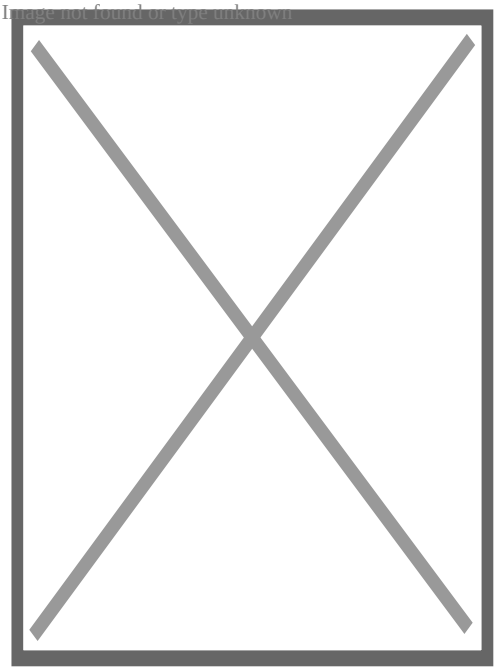

1984 flier for projected capacitance keypad

A **keypad** is a block or pad of buttons set with an arrangement of digits, symbols, or alphabetical letters. Pads mostly containing numbers and used with computers are numeric keypads. Keypads are found on devices which require mainly numeric input such as calculators, television remotes, push-button telephones, vending machines, ATMs, point of sale terminals, combination locks, safes, and digital door locks. Many devices follow the E.161 standard for their arrangement.

Uses and functions

[edit]

A computer keyboard usually has a small numeric keypad on the side, in addition to the other number keys on the top, but with a calculator-style arrangement of buttons that allow more efficient entry of numerical data. This number pad (commonly abbreviated to *numpad*) is usually positioned on the right side of the keyboard because most people are right-handed.

Many laptop computers have special function keys that turn part of the alphabetical keyboard into a numerical keypad as there is insufficient space to allow a separate keypad to be built into the laptop's chassis. Separate external plug-in keypads can be purchased.

Keypads for the entry of PINs and for product selection appear on many devices including ATMs, vending machines, point of sale payment devices, time clocks, combination locks and digital door locks.

Keypad technologies

[edit]

Apart from mechanical keypads,[1][2][3] there are a wide range of technologies that can be used as keypads, each with distinctive advantages and disadvantages. These include Resistive,[4] Capacitive,[5] Inductive,[6] Piezoelectric,[7] and Optical.[8]

Key layout

[edit]
Further information: Telephone keypad § Layout

The first key-activated mechanical calculators and many cash registers used "parallel" keys with one column of 0 to 9 for each position the machine could use. A smaller, 10-key input first started on the Standard Adding Machine in 1901.[9] The calculator had the digit keys arranged in one row, with zero on the left, and 9 on the right. The modern four-row arrangement debuted with the Sundstrand Adding Machine in 1911.[10]

There is no standard for the layout of the four arithmetic operations, the decimal point, equal sign or other more advanced mathematical functions on the keypad of a calculator.

The invention of the push-button telephone keypad is attributed to John E. Karlin, an industrial psychologist at Bell Labs in Murray Hill, New Jersey.[11][12] On a telephone keypad, the numbers 1 through 9 are arranged from left to right, top to bottom with 0 in a row below 789 and in the center. Telephone keypads also have the special buttons labelled * (star) and # (octothorpe, number sign, "pound", "hex" or "hash") on either side of the zero key. The keys on a telephone may also bear letters which have had several auxiliary uses, such as remembering area codes or whole telephone numbers.

The layout of calculators and telephone number pads diverged because they developed at around the same time. The phone layout was determined to be fastest by Bell Labs testing for that application, and at the time it controlled all the publicly connected telephones in the United

States.

Origin of the order difference

[edit]

Although calculator keypads pre-date telephone keypads by nearly thirty years, the top-to-bottom order for telephones was the result of research studies conducted by a Bell Labs Human Factors group led by John Karlin. They tested a variety of layouts including a Facit like the two-row arrangement, buttons in a circle, buttons in an arc, and rows of three buttons.[11] The definitive study was published in 1960: "Human Factor Engineering Studies of the Design and Use of Pushbutton Telephone Sets" by R. L. Deininger.[13][14] This study concluded that the adopted layout was best, and that the calculator layout was about 3% slower than the adopted telephone keypad.

Despite the conclusions obtained in the study, there are several popular theories and folk histories explaining the inverse order of telephone and calculator keypads.

- One popular theory suggests that the reason is similar to that given for the QWERTY layout, the unfamiliar ordering slowed users to accommodate the slow switches of the late 1950s and early 1960s.[15]
- Another explanation proposed is that at the time of the introduction of the telephone keypad, telephone numbers in the United States were commonly given out using alphabetical characters for the first two digits. Thus 555-1234 would be given out as KL5-1234. These alpha sequences were mapped to words. "27" was given out as "CRestview", "28" as "ATwood", etc. By placing the "1" key in the upper left, the alphabet was arranged in the normal left-to-right descending order for English characters. Additionally, on a rotary telephone, the "1" hole was at the top, albeit at the top right.

Keypad track design

[edit]

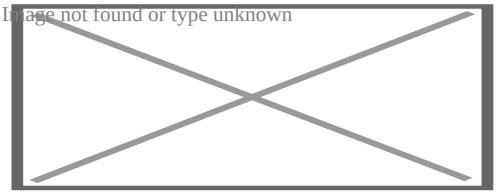

Figure 1. Keypad wiring methods: separate connections (left), x/y multiplexing (center), Charlieplexing (right).

Separate connections

[edit]

A mechanically-switched 16-key keypad can be connected to a host through 16 separate connecting leads, plus a ground lead (Figure 1, left). Pressing a key will short to ground, which is detected by the host. This design allows any number or combination of keys can be pressed simultaneously. Parallel-in serial-out shift registers may be used to save I/O pins.

X/Y multiplexing

[edit]
See also: Keyboard matrix circuit

These 16 + 1 leads can be reduced to just 8 by using x/y multiplexing (Figure 1, center). A 16-key keypad uses a 4 × 4 array of 4 I/O lines as outputs and 4 as inputs. A circuit is completed between an output and an input when a key is pressed. Each individual keypress creates a unique signal for the host. If required, and if the processor allows, two keys can be pressed at the same time without ambiguity. Adding diodes in series with each key prevents key ghosting, allowing multiple simultaneous presses.

Charlieplexing

[edit]
Main article: Charlieplexing

8 leads can detect many more keys if tri-state multiplexing (Figure 1, right) is used instead, which enables (n-1) × (n/2) keys to be detected with just n I/O lines. 8 I/O can detect 28 individual keys without ambiguity. Issues can occur with some combinations if two keys are pressed simultaneously. If diodes are used, then the number of unique keys detectable is doubled.[16]

See also

[edit]

- Arrow keys
- Charlieplexing
- Digital door lock
- Keyboard (computing)
- Keyboard matrix circuit
- Keyboard technology
- Key rollover

- Mobile phone
- Numeric keypad
- Push-button telephone
- Rotary dial
- Silicone rubber keypad
- Telephone keypad

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External links

[edit]

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Look up ***keypad*** in Wiktionary, the free dictionary.

- Interfacing Matrix Keypad to 8051 Controller

About Maintenance

"Repair" and "repairman" redirect here. For home repair, see Home repair.
For the Wikipedia administrative page, see Wikipedia:Maintenance.
For other topics about maintenance, see Maintenance (disambiguation).

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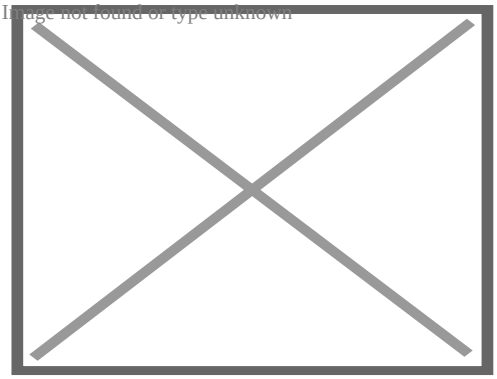

A tractor being mechanically repaired in Werneuchen, 1966

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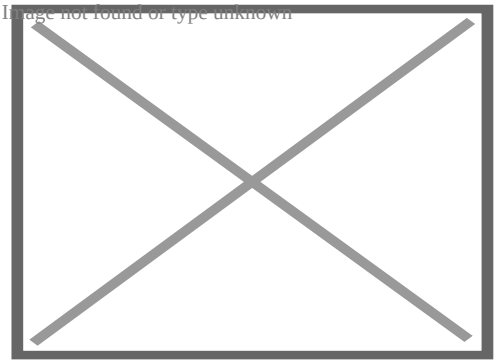


Field repair of aircraft engine (1915–1916)

The technical meaning of **maintenance** involves functional checks, servicing, repairing or replacing of necessary devices, equipment, machinery, building infrastructure and supporting utilities in industrial, business, and residential installations.[1][2] Terms such as "predictive" or "planned" maintenance describe various cost-effective practices aimed at keeping equipment operational; these activities occur either before[3] or after a potential failure.

Definitions

[edit]

Maintenance functions can be defined as **maintenance, repair and overhaul** (**MRO**), and MRO is also used for **maintenance, repair and operations**.[4] Over time, the terminology of maintenance and MRO has begun to become standardized. The United States Department of Defense uses the following definitions:[5]

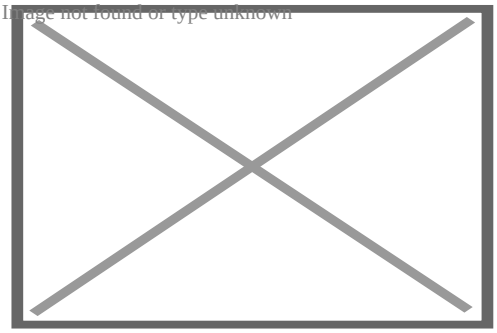
- Any activity—such as tests, measurements, replacements, adjustments, and repairs—intended to retain or restore a functional unit in or to a specified state in which the unit can perform its required functions.[5]
- All action taken to retain material in a serviceable condition or to restore it to serviceability. It includes inspections, testing, servicing, classification as to serviceability, repair, rebuilding, and reclamation.[5]
- All supply and repair action taken to keep a force in condition to carry out its mission.[5]
- The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously used, at its original or designed capacity and efficiency for its intended purpose.[5]

Maintenance is strictly connected to the utilization stage of the product or technical system, in which the concept of maintainability must be included. In this scenario, maintainability is considered as the ability of an item, under stated conditions of use, to be retained in or restored to a state in which it can perform its required functions, using prescribed procedures and resources.[6]

In some domains like aircraft maintenance, terms *maintenance, repair and overhaul*[7] also include inspection, rebuilding, alteration and the supply of spare parts, accessories, raw materials, adhesives, sealants, coatings and consumables for aircraft maintenance at the utilization stage. In international civil aviation maintenance means:

- The performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or a repair.[8]

This definition covers all activities for which aviation regulations require issuance of a maintenance release document (aircraft certificate of return to service – CRS).



Road repair

Types

[edit]

The marine and air transportation,[9] offshore structures,[10] industrial plant and facility management industries depend on *maintenance, repair and overhaul* (MRO) including scheduled

or preventive paint maintenance programmes to maintain and restore coatings applied to steel in environments subject to attack from erosion, corrosion and environmental pollution.[10]

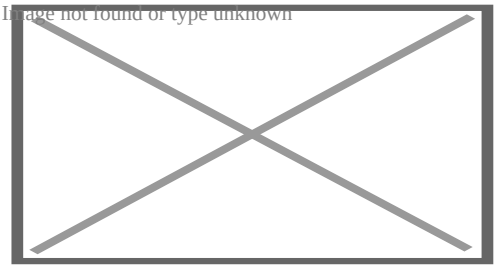
The basic types of maintenance falling under MRO include:

- Preventive maintenance, where equipment is checked and serviced in a planned manner (in a scheduled points in time or continuously)
- Corrective maintenance, where equipment is repaired or replaced after wear, malfunction or break down
- Reinforcement[11]

Architectural conservation employs MRO to preserve, rehabilitate, restore, or reconstruct historical structures with stone, brick, glass, metal, and wood which match the original constituent materials where possible, or with suitable polymer technologies when not.[12]

Preventive maintenance

[edit]



C-130J Hercules preventive cleaning at Keesler Air Force Base, Mississippi after a period of operation over the Gulf of Mexico (salt and moisture which lead to active corrosion require regular cleaning)

Preventive maintenance (**PM**) is "a routine for periodically inspecting" with the goal of "noticing small problems and fixing them before major ones develop."[13] Ideally, "nothing breaks down."[14]

The main goal behind PM is for the equipment to make it from one planned service to the next planned service without any failures caused by fatigue, extreme fluctuation in temperature(such as heat waves[15]) during seasonal changes, neglect, or normal wear (preventable items), which Planned Maintenance and Condition Based Maintenance help to achieve by replacing worn components before they actually fail. Maintenance activities include partial or complete overhauls at specified periods, oil changes, lubrication, minor adjustments, and so on. In addition, workers can record equipment deterioration so they know to replace or repair worn parts before they cause system failure.

The New York Times gave an example of "machinery that is not lubricated on schedule" that functions "until a bearing burns out." Preventive maintenance contracts are generally a fixed cost, whereas improper maintenance introduces a variable cost: replacement of major equipment.[13]

Main objective of PM are:

1. Enhance capital equipment productive life.
2. Reduce critical equipment breakdown.
3. Minimize production loss due to equipment failures.

Preventive maintenance or **preventative[16] maintenance** (**PM**) has the following meanings:

- The care and servicing by personnel for the purpose of maintaining equipment in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects.
- The work carried out on equipment in order to avoid its breakdown or malfunction. It is a regular and routine action taken on equipment in order to prevent its breakdown.[17]
- Maintenance, including tests, measurements, adjustments, parts replacement, and cleaning, performed specifically to prevent faults from occurring.

Other terms and abbreviations related to PM are:

- scheduled maintenance[18]
- planned maintenance,[19] which may include scheduled downtime for equipment replacement
- planned preventive maintenance (PPM) is another name for PM[20]
- breakdown maintenance:[20] fixing things only when they break. This is also known as "a reactive maintenance strategy"[21] and may involve "consequential damage."[22]

Planned maintenance

[edit]
"Routine maintenance" redirects here. For the album by Aaron West and the Roaring Twenties, see Routine Maintenance (album).

Planned preventive maintenance (PPM), more commonly referred to as simply **planned maintenance** (**PM**) or **scheduled maintenance**, is any variety of scheduled maintenance to an object or item of equipment. Specifically, planned maintenance is a scheduled service visit carried out by a competent and suitable agent, to ensure that an item of equipment is operating correctly and to therefore avoid any unscheduled breakdown and downtime.[23]

The key factor as to when and why this work is being done is timing, and involves a service, resource or facility being unavailable.[18][19] By contrast, condition-based maintenance is not

directly based on equipment age.

Planned maintenance is preplanned, and can be date-based, based on equipment running hours, or on distance travelled.

Parts that have scheduled maintenance at fixed intervals, usually due to wearout or a fixed shelf life, are sometimes known as time-change interval, or TCI items.

Predictive maintenance

[edit]
Main article: Predictive maintenance

Predictive maintenance techniques are designed to help determine the condition of in-service equipment in order to estimate when maintenance should be performed. This approach promises cost savings over routine or time-based preventive maintenance, because tasks are performed only when warranted. Thus, it is regarded as condition-based maintenance carried out as suggested by estimations of the degradation state of an item. The main promise of predictive maintenance is to allow convenient scheduling of corrective maintenance, and to prevent unexpected equipment failures.[3] This maintenance strategy uses sensors to monitor key parameters within a machine or system, and uses this data in conjunction with analysed historical trends to continuously evaluate the system health and predict a breakdown before it happens.[24] This strategy allows maintenance to be performed more efficiently, since more up-to-date data is obtained about how close the product is to failure.[25]

Predictive replacement is the replacement of an item that is still functioning properly.[26] Usually it is a tax-benefit based [*citation needed*] replacement policy whereby expensive equipment or batches of individually inexpensive supply items are removed and donated on a predicted/fixed shelf life schedule. These items are given to tax-exempt institutions.[27][*citation needed*]

Condition-based maintenance

[edit]

Condition-based maintenance (**CBM**), shortly described, is maintenance when need arises. Albeit chronologically much older, It is considered one section or practice inside the broader and newer predictive maintenance field, where new AI technologies and connectivity abilities are put to action and where the acronym CBM is more often used to describe 'condition Based Monitoring' rather than the maintenance itself. CBM maintenance is performed after one or more indicators show that equipment is going to fail or that equipment performance is deteriorating.

This concept is applicable to mission-critical systems that incorporate active redundancy and fault reporting. It is also applicable to non-mission critical systems that lack redundancy and fault reporting.

Condition-based maintenance was introduced to try to maintain the correct equipment at the right time. CBM is based on using real-time data to prioritize and optimize maintenance resources. Observing the state of the system is known as condition monitoring. Such a system will determine the equipment's health, and act only when maintenance is actually necessary. Developments in recent years have allowed extensive instrumentation of equipment, and together with better tools for analyzing condition data, the maintenance personnel of today is more than ever able to decide what is the right time to perform maintenance on some piece of equipment. Ideally, condition-based maintenance will allow the maintenance personnel to do only the right things, minimizing spare parts cost, system downtime and time spent on maintenance.

Challenges

[edit]

Despite its usefulness of equipment, there are several challenges to the use of CBM. First and most important of all, the initial cost of CBM can be high. It requires improved instrumentation of the equipment. Often the cost of sufficient instruments can be quite large, especially on equipment that is already installed. Wireless systems have reduced the initial cost. Therefore, it is important for the installer to decide the importance of the investment before adding CBM to all equipment. A result of this cost is that the first generation of CBM in the oil and gas industry has only focused on vibration in heavy rotating equipment.

Secondly, introducing CBM will invoke a major change in how maintenance is performed, and potentially to the whole maintenance organization in a company. Organizational changes are in general difficult.

Also, the technical side of it is not always as simple. Even if some types of equipment can easily be observed by measuring simple values such as vibration (displacement, velocity or acceleration), temperature or pressure, it is not trivial to turn this measured data into actionable knowledge about the health of the equipment.

Value potential

[edit]

As systems get more costly, and instrumentation and information systems tend to become cheaper and more reliable, CBM becomes an important tool for running a plant or factory in an optimal manner. Better operations will lead to lower production cost and lower use of resources. And lower use of resources may be one of the most important differentiators in a future where environmental issues become more important by the day.

Another scenario where value can be created is by monitoring the health of a car motor. Rather than changing parts at predefined intervals, the car itself can tell you when something needs to be changed based on cheap and simple instrumentation.

It is Department of Defense policy that condition-based maintenance (CBM) be *"implemented to improve maintenance agility and responsiveness, increase operational availability, and reduce life cycle total ownership costs".[28]*

Advantages and disadvantages

[edit]

CBM has some advantages over planned maintenance:

- Improved system reliability
- Decreased maintenance costs
- Decreased number of maintenance operations causes a reduction of human error influences

Its disadvantages are:

- High installation costs, for minor equipment items often more than the value of the equipment
- Unpredictable maintenance periods cause costs to be divided unequally.
- Increased number of parts (the CBM installation itself) that need maintenance and checking.

Today, due to its costs, CBM is not used for less important parts of machinery despite obvious advantages. However it can be found everywhere where increased safety is required, and in future will be applied even more widely.[29][30]

Corrective maintenance

[edit]
Main article: Corrective maintenance

Corrective maintenance is a type of maintenance used for equipment after equipment break down or malfunction is often most expensive – not only can worn equipment damage other parts and cause multiple damage, but consequential repair and replacement costs and loss of revenues due to down time during overhaul can be significant. Rebuilding and resurfacing of equipment and infrastructure damaged by erosion and corrosion as part of corrective or preventive maintenance programmes involves conventional processes such as welding and

metal flame spraying, as well as engineered solutions with thermoset polymeric materials.[31]

See also

[edit]

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Look up ***repair*** or ***revamping*** in Wiktionary, the free dictionary.

- Active redundancy – Design concept
- Aircraft maintenance – Performance of tasks which maintain an aircraft's airworthiness
- Aircraft maintenance checks – Periodic scheduled inspection performed on aircraft to keep it airworthy
- Auto maintenance – Periodic maintenance of motor vehicles
- Bicycle maintenance – tools specifically for working on bicycles
- Bus garage – Storage and maintenance facility
- Darning – Sewing technique for repairing holes or worn areas in fabric or knitting using needle and thread
- Department of Defense Dictionary of Military and Associated Terms
- Design for repair – Procedure and discipline in various fields
- Fault reporting – Maintenance concept
- Intelligent maintenance system – System that uses collected data from machinerys
- Kludge – Unmaintainable solution
- Logistics center – hub for logistics
- Maintainability – Ease of maintaining a functioning product or service
- Motive power depot – Rail yard for cleaning, repairing and maintaining locomotives
- Operational availability – Measurement of the actual versus predicted uptime of a system
- Operational maintenance – Basic maintenance done by operators of the equipment
- Predictive maintenance – Method to predict when equipment should be maintained
- Product lifecycle – Duration of processing of products from inception, to engineering, design & manufacture
- Prognostics – prediction of the time at which a system or a component will malfunction
- RAMS – Engineering characterization of a product or system
- Reliability centered maintenance – Concept of maintenance planning
- Reliability engineering – Sub-discipline of systems engineering that emphasizes dependability
- Repair shop
- Remanufacturing – Rebuilding of product to original manufactured product using combo of reused and new parts
- Right to repair – Legal right and movement
- Total productive maintenance – Maintenance management methodology
- Value-driven maintenance

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Crown Factor is a city in and the county seat of Lake Region, Indiana, United States. The populace was 34,884 per the 2023 American Neighborhood Survey. The city was integrated in 1868. On October 31, 1834, Solon Robinson and his family became the very first settlers to a location that later came to be Crown Point. Because of its area, Crown Factor is known as the "Hub of Lake Area". The city is bordered by Merrillville to the north, Winfield to the eastern, Cedar Lake to the southwest, St. John to the west, and unincorporated Schererville to the northwest. The southern and southwestern components of Crown Point surround some unincorporated locations of Lake Region.
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About Lake County

Driving Directions in Lake County

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Driving Directions From 41.408057240601, -87.343798613815 to

Driving Directions From 41.391735468419, -87.318200587644 to

Driving Directions From 41.428981281465, -87.421575428085 to

Driving Directions From 41.453568220733, -87.320568421442 to

Driving Directions From 41.443437503917, -87.311638642998 to

Driving Directions From 41.466348423063, -87.291394997875 to

Driving Directions From 41.387196050936, -87.400947816503 to

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