

Plant Engineering(67063)

Concept of plant Maintenance

Plant Maintenance

- Plant maintenance is the service and repair of assets and equipment. During normal operation, assets may accumulate wear-and-tear that needs to be addressed. Deviations outside of normal operation of cause the majority of damage to equipment and assets. Plant maintenance includes scheduled and unscheduled maintenance.

Principle of plant maintenance

- 1. Preventive maintenance control** : Preventive maintenance control enables the organization to lower repair cost by avoidance of down time, machine breakage and process variability. It also provide planning, scheduling and control of facilities.
- 2. Equipment tracking** : An equipment is a useful thing which needs to be protect and monitor. It's cost constitute the single largest expenditure of an organization.
- 3. Component tracking** : Components are the subsets of larger equipment and also it deserve same amount of cost control expenditure. It enables expenditure managers to identify components with repair problems.
- 4. Plant maintenance calibration tracking** : It allows organizations to fully use their investments in the plant maintenance module.
- 5. Plant maintenance warranty claims tracking** : It is an administrative system to provide control of all items covered by manufacturer and vendor warranties. It includes the ability to establish the type and length of warranty.

Preventive Maintenance of boiler

- If applicable blowdown or sweep area to remove debris
- Check for exterior leakages
- Check exhaust temperature
- Check pressure readings – boiler pressure
- Listen for unusual noises, vibrations or rattles
- Ensure vents are not obstructed or blocked
- Check display panel for error codes, service notifications and operating controls
- Check oil level (compressor lube tank)
- Check for low water level
- Check dealkalizer
- Check flame for damage or soot

Monthly Checklist

- In your monthly checklist, you will touch on some of your daily checklists while also adding some extra points. Monthly checklists for your boiler maintenance is important for tracking performance and ensuring longevity in your assets.
- Your monthly preventive maintenance checklist will comprise of:
 - Check for build up of debris on external
 - Check external for hot spots or leaks
 - Check combustion air
 - Check flue gas vent for leaks
 - Inspect boiler relief valve
 - Inspect burner's diffusers
 - Ensure lights and alarms are working
 - Inspect belts
 - Check for air leaks around openings
 - Blowout water column
 - Check relief valve – check for leaks
 - Check drain lines and trap for leaks or blockages
 - Check gaskets are tight
 - Clean surface as required
 - Ensure your chemicals are within the correct level

Periodic Checklist

- A periodic preventive maintenance checklist for your boiler systems will involve more detail and is often scheduled in seasonal or quarterly intervals. When constructing your boiler [breakdown maintenance](#) checklist, you need to consider the effects of seasonal weather such as extreme heat, snow or ice. Your checklist may vary slightly from season to season and you may need to review your process based on the climate your boiler system is located in.
- When maintaining your boiler, your periodic checklist will look like:
 - Check external boiler system for debris, snow or dried leaves
 - Check relief valve discharge pipe and hydronic pipe
 - Check drain system
 - Inspect switches
 - Ensure wiring is not frayed- replace if applicable
 - Check burner assembly
 - Ensure burner flames haven't changed appearance
 - Check water levels and low water cutoff
 - Check water pH levels
 - Inspect conditions of gaskets – replace if needed
 - Inspect pump and base mounts
 - Measure oxygen, carbon monoxide and nitrogen oxide levels with combustion analyzer
 - Clean plugs or pipes as needed

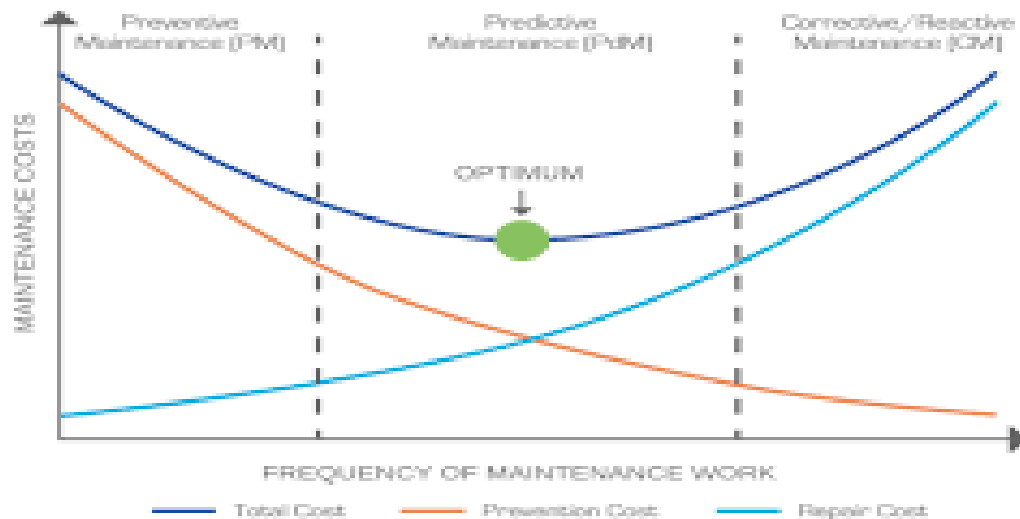
Annual Boiler Maintenance Checklist

- Your [annual maintenance checklist](#) is often a requirement from your contract or warranty agreement and can be vital in extending your boiler system life cycle.
- For your annual inspection you should include:
 - Check external for corrosion or debris build up
 - Inspect burner flame for changes
 - Check for blockages in drain valves
 - Check condensate system
 - Check for internal and external leaking
 - Check display for error codes
 - Check hydronic piping
 - Inspect boiler temperature

- Ensure secure connections and wires
- Check water pH levels
- Check chemical feed system
- Clean burner assembly
- Flush system to remove build up of sediment
- Check gas valves for steam boiler
- Clean tube and tube sheets
- Inspect burner refractory
- Inspect moving parts for easy lubrication
- Inspect quality of insulating material for wear and tear
- Check chemical feeds
- Recalibrate boiler system error codes, service codes and operating controls

Breakdown Maintenance

- Breakdown maintenance is maintenance performed on a piece of equipment that has broken down, faulted, or otherwise cannot be operated. The goal of breakdown-maintenance is to fix something that has malfunctioned. To the contrary, preventive maintenance is performed in order to keep something running.



LATHE MAINTENANCE

- We'll talk more about an actual maintenance checklist shortly, but first there are three simple steps to consider that will set you up for a successful maintenance schedule.
- Start with a quality lathe.
- Even the best, most rigorous maintenance schedule in the world will only delay the inevitable if you start with a cheaply-made lathe. Choose a reliable brand from a reputable manufacturer. You could even consider an American-designed lathe that draws on the long tradition of high-quality machine tools made in the U.S.A.
- Whatever brand you settle on, if you start with a quality machine your maintenance will be more effective and you'll likely see improvements to the lifespan of your machine.
- Use trained and skilled operators.
- Nothing can damage a lathe faster than poor operation. Running a lathe too fast, or feeding a heavy-duty part through too quickly are just two of the ways in which an operator can cause serious damage to a metal lathe. Rely on operators who are skilled and well-trained; they will also be more likely to follow a strict maintenance schedule.
- Follow a clear schedule.
- Lathe maintenance isn't something you can do once and forget about it, or even something that you need to do only once a week. At least some parts of a good maintenance schedule should be done on a daily basis. Following a simple but clear maintenance schedule every day will reduce the number of repairs and major overhauls you require.

- DAILY CHECKLIST

- These are best done every day, typically at the beginning of a new shift. None of these steps is terribly time-consuming or technical.
- Check gauges – hydraulics, water line pressure gauges
- Check air pressure
- Warm up spindle – low speed for five minutes
- Clear off chips from waycovers
- Clean chip filter

- WEEKLY CHECKLIST

- Inspect all filters
- Check coolant levels and concentration
- Inspect for oil/grease buildup
- Top up oil levels

- **How to properly care and maintain, to keep them running in good shape.**

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It goes without saying that cranes are a useful resource in the construction industry. What would we do without them to lift, pull, and haul heavy materials such as precast concrete and iron?

Now in the 21st century, their usability has extended to other industries such as mining, manufacturing, and a host of others. Cranes are generally categorized by their uses and mechanism of operation, and one such type is the hydraulic crane. Hydraulic equipment uses a combination of pistons and confined liquids (mostly oil) to transmit pressure from one point to another with a much greater force.

Therefore, a hydraulic crane is powered by a fluid-filled hydraulic system. Hydraulic cranes, specifically, are powerful and used in transporting very heavy objects that electric or fossil fuel powered cranes fall short of.

- As with all other heavy equipment, hydraulic cranes require specialized training and certification before they can be operated. They also require adequate care and maintenance for efficient operations and for avoiding operational hazards.

Here are some tips for keeping your hydraulic cranes in good shape. Operational training and certification

The primary and most important aspect of caring for hydraulic cranes is to ensure professional training and certification of operators. Hydraulic cranes are large and powerful, which means accidents can be fatal. Operational failures are routine experience with cranes and could put operators and those close by at risk of falling objects.

- Improperly assembled cranes can also tip over, thereby causing large-scale damage. Professional training and certification give operators the required skills and safety procedures in crane operations. Including, but not limited to, the following:
 - Preoperational checks;
 - Availability of fire extinguishers; and
 - Operational checks of systems like brakes, lights, steering, alarms, etc.

Comprehensive repair and support plan

Hydraulic cranes require a strict preventative maintenance plan, so breakdowns at the worst possible moment are avoided. A scheduled plan anticipates and prevents problems before they occur. Services like this are recommended and offered by hydraulic repair experts.

A preventative maintenance strategy will give your cranes a healthy safety margin, (i.e., replacement of worn components before they break). This decreases costs in the long run.

Damage offset and general wear

Cranes are generally susceptible to dirt and hazards because of the environment they operate in. Crane vibration moves parts such as screws and fasteners out of specified range settings, upsetting rigging and loosening formerly secure assemblies. Though dirt (or other elements) on hydraulic crane exteriors isn't necessarily harmful, it can do harm when it gets into the hydraulic system. A strong maintenance program ensures the hydraulic system and fluids are free of external elements, moving parts are retightened and fresh lubrication is applied at regular intervals.

Proper inventory management

Another important aspect of hydraulic crane maintenance is proper inventory management. This simply means ensuring spare parts are promptly and readily available as, and when, needed. Hydraulic cranes, as with all equipment, need to be repaired regularly. So if you replace components and keep an accurate and up-to-date inventory of materials for your crane, you can be sure that components will never be overworked due to lack of replacements.