Foundry maintenance

Planned maintenance—Objective: to maximize the efficiency of plant and equipment by keeping them in good condition. Unplanned maintenance can result in many avoidable disruptions; a few of these are:

1. No spare parts in stock or readily available from supplier.
2. Seize or rapid wear of working parts due to lack of lubrication or cleaning.
3. Undetected failure of plant causing further preventable damage, such as a faulty sand screen allowing passage of lumps of metal.
4. Split sand and accumulated rubbish blocking access to failed machinery or lubrication points.
5. No ready means of lifting out failed parts, such as motors, sand-mill components.
6. Blockage of extraction systems, impairing working conditions.
7. Damage to parts caused by the use of wrong lubricants.
8. Crane or fork-lift truck out of action.
9. No records and information on plant and components existing, when urgently needed.
10. Wasteful use of maintenance personnel.

The consequences of unplanned maintenance are: poor plant performance, undue loss of costly production time, high breakdown-correction costs, high levels of castings scrapped, and broken promises of delivery—all resulting in loss of profit.

This loss can be estimated, compared with the cost of a planned-maintenance programme—and usually found to show a saving attainable. Benefits not directly measured in cash terms, such as customer satisfaction, provide a bonus.

Essentials of planned maintenance

Plant & equipment register—All plant, including such items as lengths of conveyor, an elevator, a core blower, a fork-lift truck, should be numbered (preferably marked with a suitable small number plate or disc), and allocated a record card in the plant-register file. This register forms the basis of the control system for planned maintenance. The maintenance-records section should also contain any maintenance manuals, lubrication recommendations, drawings etc., supplied by the plant and equipment manufacturers.

Development of maintenance records—Based on the plant-register cards, these should be built up to include all essential information such as: specifications and source of supply of spare parts, lubricants, frequency of lubrication, inspection reports, and history of repairs and replacements.

Good records may make replacement possible before failure—one of the objectives of planned maintenance.

Lubrication programme—This must be organized so that each lubrication point (on every item of plant and equipment) is given the correct dose of lubricant regularly (whether hourly, daily or weekly).

Some important points about lubrication:

1. Use a minimum number of grades of lubricants, these being standardized in collaboration with the lubricant manufacturer.
2. Organize a central store where clearly-labelled lubricants can be kept in clean conditions and with minimum fire risk.
3. Use a colour-code system wherever practicable to relate lubricants, lubricating equipment, and lubricating points.
4. Establish and specify the grade of lubricant and frequency of lubrication for each point in every item of plant and equipment. Enter this information on the plant-register card.
5. Plan lubrication schedules to give the shortest routes, to save lubricator's time and reduce the risk of points being missed.
6. Consider the use of centralized automatic lubrication wherever practicable since this can save labour and lubricant and be more reliable.

Inspection programme—To reveal deterioration before breakdown occurs, so that repair or replacement of parts can be undertaken outside shift hours. Check the condition of moving parts, surfaces susceptible to wear, screens, and filters etc. regularly; this procedure reduces machine downtime to a minimum, lessens the risk of extension of damage, and ensures that replacement parts, maintenance equipment, and labour are ready.

Inspection should also ensure that all lubrication points remain accessible.

Maintenance personnel—Training, experience and qualifications must be geared to the maintenance work involved. Intricate automatic plants and control systems are increasingly being installed in foundries, and first-class mechanical, electrical, hydraulic, electronic and control-systems engineers are needed in the maintenance team. Personnel training, before new kinds of plant come into use, is essential.

Good housekeeping—Accumulations of spilt sand, broken tackle, old moulding boxes, etc., are usually signs of poor plant-maintenance standards. A clean and tidy foundry, operating efficient lubrication and inspection programmes, has already taken a major step towards establishing an effective planned-maintenance system.
Typical record & schedule cards for a planned-maintenance system.

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