

1 Each individual piece of equipment requires a separate number and a card with all identifying maintenance data

3 Good operating men often see trouble coming, request unscheduled maintenance on this form

4 Material costs developing from a requested maintenance job or from a regularly scheduled one are collected and recorded for company use

Preventive Maintenance Requires Firm Scheduling

► PREVENTIVE MAINTENANCE in an industrial plant (1) reduces unscheduled outages (2) establishes engineering control on production equipment and (3) simplifies appraisal and auditing studies.

How do you go about setting up a preventive maintenance program in a typical plant? An industrial plant may have any number of major departments—for instance, power generation, fermentation, grain preparation, or whatever the major processes run.

Preliminary Steps. First step in establishing preventive maintenance is to make up an equipment book. This book identifies every piece of equipment that you intend to cover in your maintenance program. The identification, preferably by number, should cover location, class of service, type of equipment, serial number and capacity.

The assigned equipment number ties down location quickly and unmistakably. For instance, number 15-067-2 means that in building 15, a certain piece of equipment is number 67, and is on the 2nd floor.

Let's add to this some engineering information. The plant engineer and

master mechanic review each piece of equipment, studying particularly operating life, trouble experiences, service load: Is it on 24-hr operation? Has it been breaking down often? What has been the nature of the break-down?

With this data, group the equipment into categories. These categories can be set up on the basis of function, class of service, or any other criteria that help in determining frequency of inspection or scheduled shutdowns.

Inspections for the first six months to a year of a preventive maintenance program must be kept fluid. At first, frequency of inspection depends upon the judgment of plant engineer, master mechanic or foreman close to operation. Once a record-keeping system begins to accumulate the experience of operation, then changes take place. For example, as time goes by trouble pulls out a given piece of equipment for much more work than previous judgment had indicated, and so frequency of inspection increases.

As a general rule, all equipment should be inspected a minimum of twice a year. More important, vital equipment operating continuously should be

checked as often as once every month.

Program Takes Form. At this point a preventive-maintenance program begins to take form. There is now available (1) an equipment list (2) an estimated inspection schedule. On top of this work out with the master mechanic's program to allocate the same volume of work for each month of the year. All pieces of equipment receive scheduled maintenance as the allocation program dictates.

The individual equipment card, Fig. 1, carries enough identifying data so the clerk handling records and scheduling knows what class of work is needed. A work order is issued to the electrical foreman, pipe fitter, operating foreman, or to someone in whatever craft keeps the equipment in working order. Work orders are shown in Fig. 2.

Procedure for compiling information from completed work orders is as follows: One order is sent to the storeroom, where it serves as authorization to issue material. A second copy stays in the engineering department for compiling labor and material charges. The third copy notifies the foreman to start work on the job.

Scheduling

Once a job is finished foreman marks order complete, maintenance clerk records information in a book, "Work Orders Completed," and computes labor cost. The storeroom clerk, also notified by the foreman, passes along material costs to (1) engineering dept and (2) accounting dept where they are entered against the job.

With this information, the plant engineer or master mechanic checks the work order and returns it to the maintenance clerk for filing and future use to check equipment maintenance costs. A total cost of repair and maintenance is compiled once a month.

When the plant engineer or master mechanic checks a work order he notes whether: (1) material runs high or low (2) only labor has been charged. He can tell from this if inspections are made often enough. With it he may decide to reschedule the preventive-maintenance procedure, subject to any later checks through operating experience or central engineering.

Unscheduled Maintenance. Over and above the repair and maintenance work growing out of a preventive program should be a system for unsched-

uled maintenance work. For instance, a good operating man can see trouble coming. To make it easy for such a man to set the wheels in motion and, incidentally, further develop this "sense of responsibility," Fig. 3 has been devised. The operating man notifies the foreman, points out the expected difficulty and Fig. 3 is filled out and submitted.

Now for the records: A material requisition form, Fig. 4, can be issued and all interested parties—general engineering, accounting, preventive-maintenance office—have the material costs developing from the requested maintenance job. But there is one more important step—an opportunity for management.

Once all facts and figures are in and enough information is at hand to fill in all spaces on Fig. 3 a real opportunity exists for management. That opportunity is to let the man issuing the original request—operating man or foreman—see the final costs. It gives him a feeling of belonging, an unquestioned asset in employer-employee relations.

A series of steps, tied to each of the major points just discussed in con-

nection with some of the details of office procedure, are as follows: Equipment-book entries involve a definite system. This book lists descriptive data on all equipment and has for each equipment entry a companion equipment index card, which lists cost of installation, estimated life, location, class of service.

Two events, which require special steps in handling the equipment book and the companion cards, are: (1) when new equipment arrives (2) when old equipment is transferred or scrapped. Special forms notify proper personnel of these changes and initiate (1) the necessary assigning or changing of numbers, locations: (2) issuing of work orders.

As for the other office details, such as tabulating costs, working out an exchange of information between accounting, stores and engineering departments, they vary with the individual plant and its practices.

A firmly scheduled preventive-maintenance program pays dividends in (1) better operation (2) closer control through first-hand information founded on recorded experiences (3) over-all reduction of maintenance costs.