

SP 47 Preventative Maintenance

1.0 PURPOSE:

- 1.1** The purpose of this program is to regularly monitor and maintain The Kuesel Group equipment in order to keep it functioning properly.

2.0 SCOPE:

- 2.1** Preventative maintenance is a maintenance program performed on equipment in order to keep it functioning properly. A good preventative maintenance program can reduce down time, thereby increasing productivity. It can also help to prevent costly repairs to equipment by reducing the possibility that equipment will experience a major breakdown.
- 2.2** The information contained in this procedure applies to all subsidiaries and divisions of The Kuesel Group.

3.0 RESPONSIBILITIES:

3.1 Management

- 3.1.1** Shall be responsible for ensuring uniform implementation and compliance with this program by employees and subcontractors.
- 3.1.2** Shall maintain an inventory of all equipment in his/her facility that requires preventative maintenance based on either manufacturer's guide, site preventative maintenance policy, or legislated requirements.
- 3.1.3** Coordinate preventative maintenance activities with responsible parties.
- 3.1.4** Inform the Safety Supervisor or Department when new equipment is purchased that requires periodic preventative maintenance.
- 3.1.5** Ensure all employees performing preventative maintenance receive appropriate item specific preventative maintenance training.

3.2 Safety Representative

- 3.2.1** Shall be responsible for providing support and guidance as needed to ensure that personnel are instructed in and trained to the requirements of this program and to applicable site specific requirements.
- 3.2.2** Shall maintain appropriate documentation as evidence of the training program and comprehension level of the personnel.
- 3.2.3** Verify that all industrial equipment goes through an initial pre-use analysis/machine check to ensure all safety features are operating properly.
- 3.2.4** Verify that preventative maintenance inspections include the evaluation of equipment components designed to protect workers' safety and health.
- 3.2.5** Provide technical oversight concerning the occupational safety and health aspects of the preventative maintenance program.

- 3.2.6** Review and approve systems used by all departments for preventative maintenance planning and recordkeeping.
- 3.2.7** Receive training in preventative maintenance topics as appropriate to their assigned duties.

3.3 Supervisor Responsibilities

- 3.3.1** Shall ensure that personnel under their direction attend and receive appropriate training and that they maintain compliance with this program.
- 3.3.2** Shall ensure that only trained employees assume active roles and perform related work in accordance with this program.

3.4 Employee Responsibilities

- 3.4.1** Shall be responsible for ensuring they understand and comprehend this program and maintain full compliance with this program and its contents.
- 3.4.2** It is the responsibility of the employee to do the following:
 - 3.4.2.1** Not perform maintenance on equipment without authorization
 - 3.4.2.2** Conduct a visual inspection of equipment prior to use to ensure safety-related features are functioning properly.
 - 3.4.2.3** Immediately notify supervisors of facility/equipment failures and/or problems noted in visual inspections.
 - 3.4.2.4** Never bypass safety features or remove guards

4.0 GENERAL INFORMATION:

- 4.1** Preventative maintenance programs are based on employee involvement and rely on knowledge, ideas, and contributions from all maintenance personnel. The program must tap into the ideas and expertise of every member of the project or facility staff.
- 4.2** When people become involved in change, they accept ownership for their project or facility. Employees need to be encouraged to participate in improvements.
- 4.3** Important aspects of managing a program include:
 - 4.3.1** Building trust.
 - 4.3.2** Providing recognition for improvements made.
 - 4.3.3** Providing the opportunity to be creative.
 - 4.3.4** Being willing to listen and act on employee suggestions.
- 4.4** Everyone involved must believe in the program and the program must relate to the project or facility.

4.5 The following objectives will ensure a successful program:

- 4.5.1** Perform maintenance at a level that will keep the facility and/or project equipment safe and in an acceptable condition without over maintaining or under maintaining.
- 4.5.2** Inspect and detect items which require continuing attention or which may impact adversely on the operation of the facility.
- 4.5.3** Promote the most effective and efficient use of staffing and resources.
- 4.5.4** Provide a more accurate means of estimating the number of operations and maintenance personnel needed.
- 4.5.5** Establish a basis for determining budgetary requirements and long-range planning projections.
- 4.5.6** Provide a means of evaluating the maintenance effort and control of the standard of operation at each facility.
- 4.5.7** Provide a method for instruction and training in proper maintenance procedures by operators and users of equipment.
- 4.5.8** Establish the workload and schedule for an effective preventative maintenance program.
- 4.5.9** Establish the components that require contractor performed maintenance due to lack of in-house expertise or staffing.
- 4.5.10** Prolong longer equipment life.
- 4.5.11** Reduce the number of repairs.
- 4.5.12** Require less standby equipment.
- 4.5.13** Reduce equipment downtime.

4.6 Do not lose sight of some requirements of laws, regulations, codes, and accreditation which are not preventative maintenance requirements. For the purposes of this procedure, the preventative maintenance program can be broken down into two categories:

- 4.6.1** Preventative Maintenance - Traditional (Lubricate, visual inspection, adjust, check parameters (temperature, pressure, vibration, tension).
- 4.6.2** Tests and Inspections - Tests and/or inspections verify the performance of the equipment (e.g., testing of emergency generator under load, internal boiler inspection, crane

inspections, eyewash inspection). Their purpose is to assure that the equipment is capable of functioning in its design parameters.

5.0 INSPECTIONS:

5.1 In deciding what to inspect take into consideration:

5.1.1 How critical is the equipment?

5.1.2 Does the normal size of the equipment without preventative maintenance exceed operating needs?

5.1.3 Is standby equipment available in case of failure?

5.1.4 Does the cost of preventative maintenance exceed the cost of repair or replacement?

5.1.5 Will failure to maintain equipment harm employees, contractors or visitors?

5.2 Inspectors

5.2.1 A PM inspector is someone who has been trained to test, replace some components, and make small repairs and adjustments as he/she inspects.

5.2.2 Inspections and tests may be separate from the preventative maintenance tasks or they may be accomplished simultaneously.

5.2.3 Maintenance duties could be assigned and rotated among the workers.

6.0 CHECKLISTS:

6.1 Preventative maintenance should be conducted through means of checklists. Documentation needs to be kept of any recommendations or corrections made by the inspector. Any repairs required as a result of the inspection should be initiated by a work order or other applicable written document. If too many repairs on the same piece of equipment are occurring, then the inspection process needs to be reviewed.

6.1.1 Is the problem encountered covered by the preventative maintenance tasks?

6.1.2 Are inspection intervals adequate?

6.1.3 Is the inspector being thorough in his duties?

6.1.4 Does the inspector need training?

6.2 Repetitive equipment failures are a clue to material failure problems which may require design changes. Repetitive failures can also indicate operational overloading or misapplication.

6.3 Inspections should neither be overdone nor underdone. It is extremely important that a follow up on the preventative maintenance program be conducted to ensure that it is enough to eliminate breakdowns but not often enough to make the inspection formidable and too costly. A good rule of thumb is that inspections should be often enough to produce repairs every third or

fourth inspection on average; they should not be so infrequent that breakdowns are occurring. Cost needs to be monitored for repairs to each piece of equipment.

- 6.4** To ensure complete and uniform maintenance, all points to be checked should be itemized on a preventative maintenance guideline form. Criteria must be specific enough that variables to check such as operating pressures, temperatures, belt slack, and type of lubricant to use are clearly spelled out in the inspection form. Inspection tasks and variables for each piece of equipment are found in guide books, manufacturer's catalogues, maintenance manuals and trade magazines. Checklists must reflect the complexity and location of preventative maintenance points for each piece of equipment as well as its condition, load and the environment within which it operates.

7.0 INVENTORY AND PM SCHEDULE:

- 7.1** An inventory of the company's machinery/equipment should be established and kept current by each region. When new machinery or equipment is acquired, it must be added to the inventory.
- 7.2** Preventative maintenance schedules will be developed for each piece of equipment found in the PM Inventory. Schedules will be based on manufacturer requirements and industry standards. Note: Maintenance manuals received with equipment shall be located with the equipment and/or at the project or an area designated by the company Equipment & Materials Manager.
- 7.3** Preventative maintenance performed on machinery or equipment must be documented and retained for the life of the machinery or equipment.
- 7.4** Defects observed in machinery or equipment shall be reported to a supervisor and must be repaired or replaced before being used again.

8.0 DOCUMENTATION AND RECORDS:

- 8.1** The preventative maintenance program applies to all Kuesel Group facilities and departments and includes any equipment that could cause serious physical harm to employees if equipment safety-related components fail.
- 8.2** Where items are subject to preventative maintenance requirements under multiple programs, the more stringent program/requirement shall apply.
- 8.3** All supervisors/managers must maintain documentation or have access to records that verify preventative maintenance schedules and the records of last maintenance inspections of equipment have been completed.

9.0 REVISION REGISTER:

Date	Description of Change	Page No.	Initials

