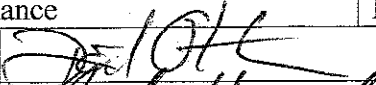
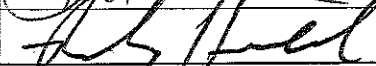


**Standard Operating Procedure (SOP)**  
**Preventive Maintenance**

<b>SOP No.</b>	MG-0006	<b>Revision:</b>	0
<b>Department:</b>	Maintenance	<b>Date:</b>	7-24-09
<b>Dept. Head Approval:</b>			7-24-09
<b>Director Approval:</b>			7/22/09

**I. Purpose:**

Purpose is to establish guidelines for Facilities Management Maintenance Preventive Maintenance (PM) System to:

- Improved system reliability.
- Decreased cost of replacement.
- Decreased system downtime.
- Better spares inventory management.

**II. Responsibilities:**

1. The following people are responsible for following this SOP:
  - a. Director of Maintenance : Responsible for:
    1. Overall responsibility for the implementation, operation and upkeep of the PM System
    2. Provide an annual report to the Vice President on the status of the PM system
  - b. Assistant Directors : Responsible for:
    1. Administration of the PM System
    2. Verifying completion of maintenance items
    3. Reviewing periodicities to and ensuring maintenance is adequately conducted
    4. Recommend improvements and changes to the system
    5. Performing Quality checks periodically on completed items
  - c. PM Operations Manager: Responsible for:
    1. Reviewing equipment data sheets for accuracy prior to submission to Administrative Support Services for entry into TMA.
    2. Assigning task sheets to newly identified equipment.
    3. Ensuring task sheets are developed for new equipment that is not currently supported by TMA.
    4. Reviewing TMA PM items and adjusting the schedule of PM Items when necessary.
    5. Maintaining QC/QA data and recommending corrective actions
    6. Maintain a file for Feedback Forms and corrective action taken.

d. Operations Managers: Responsible for:

1. Daily scheduling the PM items assigned to their areas.
2. Submitting TMA Data Collection sheets on new equipment or removed equipment to the PM Operations Manager.
3. Submitting Feedback Forms to the PM Operations Manager
4. Conducting QA/QC inspections and reviewing completed QA/QC inspections that were done in their areas.
5. Reviewing TMA PM items weekly and prior to close out.
6. Providing an explanation if a PM item is not completed as scheduled.
7. Ensuring PM items are assigned to properly trained and qualified maintenance technicians.

### **III. Definitions**

1. Preventive Maintenance – A schedule of planned maintenance actions aimed at the prevention of breakdowns and failures. The primary goal of preventive maintenance is to prevent failure of equipment before it actually occurs. It is designed to preserve and enhance equipment reliability by replacing worn components before they fail. Preventive maintenance activities include inspections, equipment checks, partial or complete overhauls at specified periods, oil changes, lubrication and so on.
2. Building levels of priority:

- a. Level 1 – comprehensive coverage of all building systems and equipment.
  1.  $\leq 5$  years old
  2. Buildings with systems critical to function/mission of building (CAC, ESB, NRCCE . . .)
- b. Level 2 – coverage of major building systems and equipment
  1.  $> 5$  years old
  2.  $\leq 35$  years old
  3. Buildings with partial renovations to systems
- c. Level 3 - coverage of building systems critical to maintain operation
  1.  $> 35$  years old
  2. Minor buildings – garages, houses, storage
- d. Level 4 – coverage of building systems to protect the asset.
  1. Empty buildings scheduled for renovation/demolition

A master list of specific equipment covered for each level of building will be maintained by the PM Operations Manager.

3. Task sheet - The specific procedure on how to complete the preventive maintenance item.
4. Periodicity – The frequency at which a Preventive Maintenance item is to be completed. Examples would be weekly, monthly, quarterly, etc.
5. Inspection - A periodic scheduled examination, lubrication, minor adjustment and servicing of plant equipment and systems for which specific maintenance personnel are responsible. Inspections are carried out to keep equipment in good running order, detect defects, estimate maintenance requirements and comply with established safety regulations.
6. TMA- West Virginia University Facilities Management computerized maintenance system.

7. TMA Data Collection Sheet – The document used to compile data on building equipment. These forms are located on the Facilities Management shared drive. S:\TMA Equipment Forms\TMA Data Collection Forms
8. QA/QC Program – Quality assurance and quality control program to provide feedback on the effectiveness of the PM program. Provides a means of identifying problems and inefficiencies and the actions taken to correct these problems.

#### **IV. Procedure**

##### **A. Equipment identification:**

1. For equipment installed or removed by Facilities Maintenance, the TMA Equipment Data Sheet will be filled out by the technician performing the work and forwarded to their manager.
2. The manager reviews the data sheet and forwards the data sheet to the Preventive Maintenance (PM) Operations Manager.
3. The PM Operations Manager will review the data sheet and assign a task sheet to the maintenance item. The data sheet and task assignment sheet are forwarded to Administrative Support Services for entry into the TMA system.
  - a. Newly installed equipment may need a task sheet generated to support required preventive maintenance. The new task sheet will be generated by the applicable shop and forwarded to the PM Operations Manager. The Operations Manager will verify the following information is included in the task sheet:
    1. Assign periodicity based on manufacturer's recommendations or current operating experience and indications where available.
    2. Provide detailed instructions on performance requirements to complete the maintenance item.
    3. Ensure Safety precautions are implemented into the task sheet to preclude personnel injury or equipment damage.
  - b. The task sheet will be reviewed by Maintenance Engineering and the appropriate Assistant Director for approval before being entered in the TMA system.
4. The data sheet and task assignment sheet are forwarded to Administrative Support Services for entry into the TMA system.
5. Equipment installed during new construction and renovations will be updated by the responsible contractor or vendor per current Maintenance Standard Operating Policy MG-004.
6. Once the data is entered into TMA the data sheets and task sheets along with Equipment Identification (ID) tags will be returned to the PM Operations Manager.
7. The PM Operations Manager will inventory and forward the Equipment ID tags to the appropriate Zone or Central Shop Manager to be attached to the respective piece of equipment.

## B. Performing Preventive Maintenance Items:

1. Zone Managers, Central Shop Managers will identify the PM items scheduled for their areas in the TMA system at the beginning of each week.
2. The manager will determine the priority of the current work load and schedule the PM to be completed by the appropriate technician.
3. The manager will be responsible for ensuring the technician assigned to the PM item is qualified and properly trained to complete the task.
4. The technician will complete the task and update the TMA system that the assigned item is complete.
  - a. Complete time spent on the PM item
  - b. Results of the inspection or the maintenance item should be placed in the remarks section in TMA.
5. The technician will notify the manager of any discrepancies identified after completion of the PM item.
6. A work order will be generated by the manager to correct any identified discrepancies.
7. The manager will review the TMA system and verify that the PM item was completed and then identify the work order as "finished".
8. If a PM task cannot be completed per the task sheet or per the schedule, a remark will be placed in TMA as to the specific reason for non-completion.
9. The PM Operations Manager will reschedule incomplete PM items for the following month.

## C. Submitting Feedback Forms:

1. The Feedback form is to be used to report errors and changes needed to our PM system the following are examples of when a Feedback Form should be submitted:
  - a. Incorrect equipment location
  - b. Incorrect Equipment ID
  - c. Incorrect task assignment
  - d. Procedural errors on task sheets
  - e. Periodicity is incorrect
  - f. PM assigned to the wrong shop
  - g. Other administrative errors
2. The individual identifying the discrepancy is responsible for filling out the Feedback Form and submitting the form to their manager for review.
3. The individual will provide a detailed description of the error, a copy of the PM item and task sheet should be attached to the form.
4. After the manager has reviewed the Feedback Form and verified it is correct it will be forwarded to the PM Operations Manager for corrective action.

- a. Administrative corrections will be sent to Administrative Support for TMA update.
  - b. Procedural errors on the Task Sheet will be sent to the appropriate Assistant Director for corrective action
  - c. Periodicity changes will be sent to Maintenance Engineering for evaluation and then to the Assistant Director for approval.
5. The PM Operations Manager will evaluate similar maintenance items as appropriate to ensure the discrepancy doesn't exist in other PM's

D. QA/QC Program:

1. The number of QA/QC Inspections assigned each quarter will be determined by the Director of Maintenance. This will be based on the performance of the previous quarter QC/QA inspections.
2. The QA/QC inspections will be assigned to various maintenance supervisors, managers, and Assistant Directors by the Director of Maintenance on the last week of each quarter for the upcoming new quarter..
3. The quarterly schedule and a QA/QC form will be given to each individual that will be required to perform a QA/QC inspection.
4. The Director of Maintenance will select random PM items that were completed within the last 3 days of the scheduled QA/QC inspection and assign them to be evaluated.
5. After receiving the identified PM, the individual conducting the QA/QC inspection will contact the technician that completed the PM item and conduct the QA/QC inspection with the technician.
6. The completed QA/QC form will be forwarded to the technicians' Assistant Director for review and to determine if any corrective action if required. **Safety violations need to be reported to the Manager and Assistant Director immediately.**
7. Each quarter the QA/QC forms will be evaluated by the Assistant Director and the Director to determine any trends and issues that require formal corrective action or additional training. A file containing one year of completed QA/QC forms will be maintained by the PM Operations Manager.

PM FEEDBACK FORM

DATE \_\_\_\_\_

Submitted by: \_\_\_\_\_ Work Group: \_\_\_\_\_

PM Item Number: \_\_\_\_\_ Work order Number: \_\_\_\_\_

Equipment Name: \_\_\_\_\_

Equipment Location: \_\_\_\_\_

Equipment ID Number: \_\_\_\_\_

Description of problem (attach a copy of work order and task sheet):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Recommended corrective action:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Action Taken:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Signature of individual submitting form

\_\_\_\_\_  
Date

\_\_\_\_\_  
PM Operations Manager Signature

\_\_\_\_\_  
Date

PM QA/QC FORM

PM Number:

PM Description:

Person completing QA/QC:

Technician:

Location Performed:

Date QA/QC Performed:

(Attach a copy of the work order and task sheet to this form)

1. Did the technician observe necessary safety precautions? \_\_\_\_\_
2. Was the technician familiar with the task sheet instructions? \_\_\_\_\_
3. Were the proper materials used (if applicable)? \_\_\_\_\_
3. Were the proper tools used (if applicable)? \_\_\_\_\_
4. Was the task sheet followed completely? \_\_\_\_\_
5. Was TMA updated correctly? \_\_\_\_\_
6. Was the technician knowledgeable about the SOP? \_\_\_\_\_

General Comments:

Corrective action  
required: \_\_\_\_\_

Corrective action  
completed: \_\_\_\_\_

Reviewed:

Technician

Date

Individual Conducting QA/QC

Date

Assistant Director

Date