

Preventive Maintenance Program

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I Overview

1. Preventive Maintenance Program Scope

The scope of the UH Preventive Maintenance Program includes the UH, UH at Katy, UH at Sugar Land, The Medical Center, Technology Bridge, and Coastal Center locations. For each of these locations, preventive maintenance plans are developed for buildings, equipment, campus infrastructure, and grounds.

2. Data Structure

The preventive maintenance program documents items (equipment, locations, etc.) at the equipment level (air handling unit, boiler, room, etc.). A standardized format of alpha numerical characters is followed to name individual types of equipment. The standardized format uses a combination of the building number, room number, equipment category, and equipment type sequential order (e.g. 496/0S100A/099/001).

10-Digit Numbering Convention (Pre 2015)

Sample Equipment Number		Building #		Floor Level 0-97		Category No 1-99		Equipment unit # 1-999	
5850112001		X	X	X	X	X	X	X	X
				98=ALL FLOORS 99=ROOF					
Category No	Category Description	Crew	Equipment Type	PM Frequency					
				Week	Month	Quarterly	Semi-Annual	Annual	
01	AUTO	AUTO	Vehicle				x	x	
02	FLEET	AUTO	Vehicle				x	x	
03	Power Distribution Unit								
04	VFD -Variable Frequency Drive	ELECTRICAL	ELECTRIC						
05	SPARE								
06	Steam Heater	HVAC	HVAC						
07	SPARE								
08	LEVITON EMERGENCY POWER INVERTER	HVAC, ELECTRICAL	HVAC						
09	DEHUMIDIFIER	HVAC	HVAC						
10	AHU	HVAC, ELECTRICAL	HVAC			X	X	X	
11	PUMP	HVAC, ELECTRICAL	HVAC				X	X	
12	SUPPLY & EXHAUST AIR FANS	HVAC, ELECTRICAL	HVAC				X	X	
13	COMPRESSED AIR DRYER	HVAC, PLANT	HVAC			X	X	X	
14	AIR COMPRESSOR	HVAC, ELECTRICAL, PLANT	HVAC			X	X	X	
15	HIGH VOLTAGE EQUIP. (TRANSFORMERS, BREAKERS, ATS, ISOLATION BREAKERS, CONTROLS)	ELECTRICAL	ELECTRIC			X	X	X	
16	STEAM TRAP	HVAC	HVAC				X	X	
17	WATER COOLER	HVAC, N(S)_Z_Maint	PLUMBING					X	
18	A/C SPLIT SYSTEM, DX, CONDENSER	HVAC, ELECTRICAL, PLANT	HVAC			X	X	X	
19	AC PACKAGE UNIT DX	HVAC, ELECTRICAL, PLANT	HVAC			X	X	X	
20	CHILLER	HVAC, ELECTRICAL	HVAC	X	X	X	X	X	
21	WALK-IN COOLER	HVAC	HVAC			X	X	X	
22	AC WINDOW UNIT	HVAC	HVAC			X	X	X	
23	COOLING TOWER	HVAC, PLANT	HVAC			X	X	X	
24	LIEBERT UNIT	HVAC	HVAC			X	X	X	
25	GENERATOR (EMERGENCY, PORTABLE)	ELECTRICAL	ELECTRIC	X	X	X	X	X	
26	SPARE								
27	FIRE ALARM SYSTEM	FIRE ALARM	FIRE					X	
28	ROOF	CONTRACT M	ROOFING					X	
29	BACKFLOW PREVENTER	N(S)_Z_Maint	PLUMBING					X	
30	SPRINKLER SYSTEM, WATER FLOW SWITCH	FIRE ALARM	FIRE			X	X	X	
31	GAS HEATER	HVAC	PLUMBING			X	X	X	
32	SPARE								
33	WATER HEATER	HVAC, ELECTRICAL, N(S)_Z_Maint	PLUMBING				X	X	
34	HEAT EXCHANGER	HVAC	HVAC				X	X	
35	BOILER	HVAC	HVAC	X	X	X	X	X	
36	600 VOLT ELECTRIC EQUIP. (PANEL BOARD, BREAKER PANEL, MCB, TRANSFORMERS, BUSS DUCT, DISCONNECT SWITCH, TRANSFORMER)								

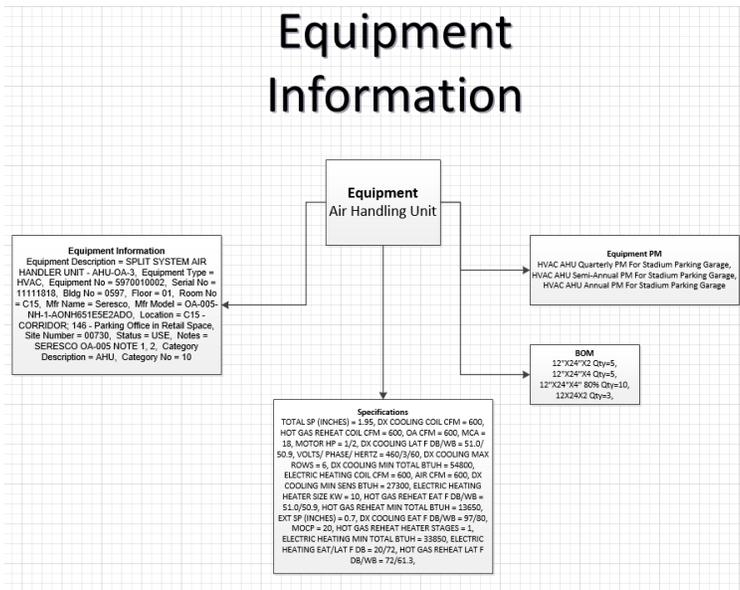
15-Digit Numbering Convention (Post 2015)

Sample Equipment Number	Building #	Room #	Category Number	Equipment unit #
49605100A099001	X X X	XXXXXX	0XX	XXX
Category No	Category Description	Crew	Equipment Type	
01	AUTO	AUTO	Vehicle	VARIOUS 1-99
02	FLEET	AUTO	Vehicle	GEN MAINT 100-199
03	Power Distribution Unit			ELECTRICAL 200-299
04	VFD -Variable Frequency Drive	ELECTRICAL	ELECTRIC	HVAC 300-399
05	SPARE			AUTO 400-499
06	Steam Heater	HVAC, Plumbing	HVAC	RESEARCH 500-599
07	SPARE			DINING 600-699
08	LEVITON EMERGENCY POWER INVERTER	HVAC, ELECTRICAL	HVAC	ACTIVITY 700-799
09	DEHUMIDIFIER	HVAC, PLAN MAINT	HVAC	FIRE 800-899
10	AHU	HVAC, ELECTRICAL, PLAN MAINT	HVAC	Misc 900-999
11	PUMP	HVAC, ELECTRICAL, PLAN MAINT	HVAC	
12	SUPPLY & EXHAUST AIR FANS	HVAC, ELECTRICAL, PLAN MAINT	HVAC	
13	COMPRESSED AIR DRYER	HVAC, PLANT	HVAC	
14	AIR COMPRESSOR	HVAC, ELECTRICAL, PLANT	HVAC	
15	HIGH VOLTAGE EQUIP. (TRANSFORMERS,	ELECTRICAL	ELECTRIC	
16	STEAM TRAP	HVAC	HVAC	
17	WATER COOLER	HVAC, N(S), Z_Maint	PLUMBING	
18	A/C SPLIT SYSTEM, DX, CONDENSER	HVAC, ELECTRICAL, PLAN MAINT	HVAC	
19	AC PACKAGE UNIT DX	HVAC, ELECTRICAL, PLAN MAINT	HVAC	
20	CHILLER	HVAC, ELECTRICAL	HVAC	
21	WALK-IN COOLER	HVAC	HVAC	
22	AC WINDOW UNIT	HVAC, PLAN MAINT	HVAC	
23	COOLING TOWER	HVAC, PLANT	HVAC	
24	COMPUTER ROOM A/C	HVAC, PLAN MAINT	HVAC	
25	GENERATOR (EMERGENCY, PORTABLE)	ELECTRICAL	ELECTRIC	
26	SPARE			
27	FIRE ALARM SYSTEM	FIRE ALARM	FIRE	
28	ROOF	CONTRACT M	ROOFING	
29	BACKFLOW PREVENTER	N(S), Z_Maint (DOMESTIC)	PLUMBING	
30	SPRINKLER SYSTEM, WATER FLOW SWITCH	FIRE ALARM	FIRE	
31	GAS HEATER	HVAC	PLUMBING	
32	SPARE			
33	WATER HEATER	HVAC, ELECTRICAL, N(S), Z_Maint	PLUMBING	
34	HEAT EXCHANGER	HVAC	HVAC	

Individual components of equipment are then addressed in the preventive maintenance task lists. The task lists are organized into modular sections to accommodate variations in equipment configuration. The preventive maintenance task lists are also organized by frequency and shop trade so that an individual piece of equipment may have separate monthly, quarterly, annual, etc. task lists for separate trades, each with distinctive tasks. Thus the preventive maintenance frequency and task contents for a type of equipment can be changed by simply changing the task lists that apply.

PM NUMBER	DESCRIPTION	CREW	CRAFT	TASK LIST	EST. HOURS	MAINT TYPE	TIMES	INTERVAL
PM000952	HVAC ZONE CONTROL ANNUAL PM	PLAN MAINT	PLAN-BMS	D30451601950 : VAV BOXES\n\nANNUAL:\nOPEN/CLOSE VAV CONTROL BOX ACCESS.\nCHECK THAT PNEUMATIC TUBING/ELECTRICAL CONNECTIONS ARE IN PLACE AND TIGHT.\nTIGHTEN ARM ON MOTOR OUTPUT SHAFT.\nCYCLE ACTUATOR WHILE WATCHING FOR PROPER OPERATION.\nVERIFY THAT BLADES FULLY OPEN AND CLOSE.LUBRICATE ACTUATOR LINKAGE AND DAMPER VERIFY BLADE PIVOT POINTS.\nFILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES.\nREPLACE FILTER IF APPLICABLE\nTURN UNIT BACK ON.	1.5	PREVENTIVE	1	Y
PM000960	FAN, CENTRIFUGAL, UP TO 5,000 CFM	PLAN MAINT	PLAN-HVAC	D30452201950 : FAN, CENTRIFUGAL, UP TO 5,000 CFM\n\nSEMI-ANNUAL:\n START AND STOP FAN WITH LOCAL SWITCH.\n CHECK MOTOR AND FAN SHAFT BEARINGS FOR NOISE, VIBRATION, OVERHEATING;\n LUBRICATE BEARINGS.\n CHECK BELTS FOR WEAR, TENSION, AND ALIGNMENT, IF APPLICABLE; ADJUST\n AS REQUIRED.\n CHECK BLOWER INTAKE DAMPERS, LUBRICATE; IF APPLICABLE.\n CHECK ELECTRICAL WIRING AND CONNECTIONS; TIGHTEN LOOSE CONNECTIONS.\n CLEAN FAN AND SURROUNDING AREA.\n FILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES.	0.54	PREVENTIVE	6	M
PM001422	HVAC AIR HANDLING UNIT, 3 TONS - 24 TONS QUARTERLY PM	PLAN MAINT	PLAN-HVAC	D30451101950 : AIR HANDLING UNIT, 3 TONS THROUGH 24 TONS\n\nQUARTERLY:\n CHECK WITH OPERATING OR AREA PERSONNEL FOR DEFICIENCIES.\n CHECK CONTROLS AND UNIT FOR PROPER OPERATION.\n CHECK FOR UNUSUAL NOISE OR VIBRATION.\n LUBRICATE SHAFT AND MOTOR BEARINGS.\n CHECK TENSION, CONDITION AND ALIGNMENT OF BELTS. ADJUST UNALIGNED BELTS.\n INSPECT COILS FOR CLEANING AND REPORT DEFICIENCIES.\n REPLACE AIR FILTERS.\n INSPECT EXTERIOR PIPING AND VALVES FOR LEAKS; TIGHTEN CONNECTIONS AS\n REQUIRED.\n CLEAN AREA AROUND EQUIPMENT.\n FILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES.\n TURN UNIT BACK ON.	0.42	PREVENTIVE	3	M

A diagram of the Preventive Maintenance Data Structure



3. CMMS

The equipment inventory for each building and area is developed following the steps outlined in Section II and III that use hand written forms and MS Excel spreadsheets. These steps are used to collect and sanitize the information from errors as much as possible before being inputted into CMMS, which is the CMMS (Computerized Maintenance Management System) utilized by the UH Facilities Services department.

The PM Master Equipment and Task Lists workbook contains the standardized equipment abbreviations and task codes used in the UH Preventive Maintenance Program. This MS Excel workbook along with the other PM program documentation is electronically stored per the direction of the PM Shop.

The need to add to the standard equipment abbreviation and task code lists occurs when the hand written equipment forms are being developed and a new type of equipment is encountered whose function doesn't fit into one of the standardized abbreviations. Details of this process are covered in Section IV, Preventive Maintenance Equipment and Task Development.

4. Equipment and Location Identification Tags

Identification tags are used to physically identify each piece of maintained equipment. For indoor locations, these tags are bar coded and are printed on vinyl label stock within the UH Facilities Services department. Since the vinyl labels are subject to weathering, temporary tags have been placed on outdoor equipment items using tags. The tags are pre-embossed with a unique sequential number, but do not have bar codes. The outdoor tag number is identified in the description field of the equipment in the CMMS database to cross reference it to the actual equipment identification. These metal foil tags will be replaced once a material can be identified that protects the vinyl labels from

weathering conditions.

When new equipment has been entered into CMMS, a work order is generally created to have the labels created and installed on the equipment. The designated CMMS equipment “Tag #” is provided along with the description and location of the equipment. In cases where the preventive maintenance cycle has begun, the PM work order is used to install the labels. The label tags are placed so that they are visible when approaching the equipment to enable trade personnel to readily identify the correct equipment.

5. Preventive Maintenance Development and Implementation

The sequence for the initial development of preventive maintenance data for each building and location was performed based on the functionality of the building and the equipment having the most significant impact on the reliability of the facility. The following are the priorities that were used for building functionality:

1. Buildings with reimbursable tenants
2. Campus infrastructure
3. Research buildings and major education buildings
4. Minor buildings and locations

To prioritize the level of significances the equipment has on the reliability to the facility, APPA Impact Levels were used. The following definitions were followed:

- Level 1 – Statutory: Code, Warranty or other Mandates
- Level 2 – Mission Critical: Failure will result in a mission failure
- Level 3 – Mission Important: Failure will result in a mission interruption
- Level 4 – Significant: Failure will cause an inconvenience

6. Preventive Maintenance Program Information

In addition to data that has been uploaded into CMMS, additional information on the Preventive Maintenance Program can be found electronically per the direction of the PM Shop.

The PM Program folder is setup with subsequent folders for each integral part of the program. The following are the folders and the description of files contained in each:

1. PM Per Trade and PM Per Location folders
2. PM Master Equipment and Task Lists folder
3. PM Backlog folder
4. PM Templates and Forms folder
5. PM Training folder
6. PM Program Development folder

1. PM Per Trade and PM Per Location folders: Includes submitted scanned copies, completed electronic spreadsheets, forms and other supporting documents such as photographs or equipment reports used to enter new equipment into the PM program or used to review and modify existing equipment in the PM Program.

- a. The PM Per Trade folder has been setup for data or documents encompassing multiple buildings or locations on campus such as a project that may include updating switchgear or backflow preventers located throughout the campus.
- b. The PM Per Location folder has been setup for data or documents specific to one location or building.

2. PM Master Equipment and Task Lists folder: Includes an Excel workbook with multiple spreadsheets providing an updated list of equipment and task used in the program with legends and a program log. The workbook is updated as new equipment or tasks are rewritten or created in the program with the latter file stored in an archive subfolder.
3. PM Backlog folder: Includes Excel reports generated through CMMS listing PM work orders scheduled for completion. These reports are disseminated to the Operations and Maintenance supervisors and updated to reflect work orders that have been completed but had not been properly closed or to cancel and reschedule a work order requiring a PM equipment task schedule change in CMMS.
4. PM Templates and Forms folder: Includes templates, forms and spreadsheets used to update the PM program with new development. This includes forms for equipment and task changes, adding new equipment for minor or larger projects and an archive folder to store templates files as they are revised.
5. PM Training folder: Includes an Excel workbook with individual training programs setup for specific equipment and tasks.
6. PM Program Development folder: Includes current, historical and archive files used to describe the development of the program.

II Preventive Maintenance Development Process – Major Projects

The following process is focused on the development of a preventive maintenance program for a high volume of new equipment being introduced to UH as part of a capital project or major institutional project.

1. Copies of construction or as-built drawings are obtained from the Facilities Archives files or during project design, construction or close-out. Drawing sheets that are typically needed for PM development are the architectural floor and roof plans, site utilities, MEP, landscape/irrigation, and special systems (fire alarm, controls, etc.).
2. Site visits are used to identify equipment and spaces that vary from the as-built drawings. These variances may be due to undocumented renovations, equipment modifications, etc. The intent is for the PM Program to document the actual equipment content of the building.
3. Each piece of equipment for a building designated for preventive maintenance is highlighted on the drawings being reviewed. It is then recorded on a hand written Equipment Inventory Form (Exhibit 1) located in the PM Templates and Forms folder that identifies the building, the equipment abbreviation, the full description of the piece of equipment including how it was labeled on the drawing, the room number or location, the drawing number, and any pertinent notes. The hand written lists are retained throughout the PM development process until the equipment inventoried is fully entered into the

CMMS database at which time they can be discarded.

4. Once the Equipment Inventory Forms are completed and validated, the information is then transferred to the Equipment Data Entry Sheet (Exhibit 2). Follow-on visits to the equipment location may be required to ensure the equipment and room numbers listed on the drawings are accurate. Once transferred, the following additional information is added on the spreadsheet to each piece of equipment:

- a. Tag # - This is a unique number given to each piece of equipment entered into CMMS following the format listed in the Data Structure section above.
- b. Location ID – This is a combination of the building acronym and room number. All discrepancies in room and area data need to be resolved before proceeding with entering equipment data into CMMS. If a correct location cannot be found in CMMS, the CMMS Administrator must be notified provide that information.
- c. Type – This reflects the category in which the equipment is associated with for maintenance determination and reporting.
- d. Repair Center – This is the UH campus in which the equipment resides.
- e. PM Task – This is the task codes for the preventive maintenance to be performed on the equipment. In most cases, the necessary task codes can be duplicated from what is listed for a similar piece of equipment in CMMS.
- f. Priority – This reflect the urgency in which the work needs to be performed. All PMs are prioritized as “4” Routine.
- g. # x – This is how often the maintenance needs to be performed. In most cases, the maintenance frequency can be duplicated from what is listed for a similar piece of equipment in CMMS.
- h. Freq – This is the period associated with the # x. Due to enhanced reporting that has been created to forecast future preventive maintenance in CMMS, the “Month” interval is to be used for maintenance frequencies of one month or greater.
- i. Est. Time – This is the standard time estimated to perform the maintenance task. The standard time can be found under “Labor Standard” on the task code in the CMMS Task Record.
- j. Trade – This is the UH Zone that will be performing the preventive maintenance task for the specific piece of equipment.
- k. Acct # - This is the Cost Center that will be charged for the preventive maintenance. For equipment and rooms/areas that will be charged to reimbursable customers, use the appropriate customer cost center. For non-reimbursable equipment and rooms/areas, use the Facilities O&M cost center for the UH campus were the maintenance is being conducted.
- l. WO Type – This is to reflect the type of Work Order and “Preventive Maintenance” should be used.
- m. Next PM Date – This is the date the first PM Work Order should be generated. In most cases, this will be the first day of the month in which the PM is to be done.

In the process of developing the equipment inventory lists, new types of equipment may be encountered that are not covered by one of the existing standardized equipment abbreviations. This will require identification of a new standard equipment abbreviation and development of new task code(s). Development of new task codes should be coordinated with the trades involved to gain their input on the task list and labor estimates. The new standard equipment abbreviation and task code(s) need to be added to the Master Equipment Abbv List (Exhibit 3) and Master Task Code List (Exhibit 4) spreadsheets located in the PM Master Equipment and Task Lists workbook. The new task sheet created for the new task code should follow the standard format template for tasks. Processes for add

task sheets and task code to CMMS are discussed in Section IV, Preventive Maintenance Task Development, of this document.

5. After all the fields in the Equipment Data Entry Sheet are populated, equipment data can begin to be added into the CMMS. This is followed by assigning the appropriate tasks and schedules to the equipment that initiates the PM cycle for the equipment. The CMMS Equipment and PM Task Entry document (Exhibit 5) provides the specific steps to follow within CMMS. A color coding system is located on the Equipment Data Entry Sheet to track the progress as information is transferred into the CMMS. Once all the information has been transferred, the Equipment Data Entry Sheet is archived in PM per Trade or PM per Location folder in the PM Program folder for future reference.

III Preventive Maintenance Development Process – Minor Projects

The following process is focused on the development of a preventive maintenance program for individual or small volumes of new or replacement equipment being introduced to UH as part of institutional or O&M projects. The same process is followed if previously undocumented equipment is identified in the field and should have preventive maintenance performed on it.

1. Information on the equipment such as shop drawings, project submittal documents or O&M manuals are requested from institutional project team personnel during the project close-out process. These documents are used to complete a PM Minor Project Equipment Form (Exhibit 6) on the piece of equipment to be entered into the CMMS. A completed PM Minor Project Equipment Form has all the necessary information to add the equipment and tasks into the CMMS without transferring the information into the Equipment Data Entry Sheet. Due to the substantial amount of forms that would be produced during major projects with high volumes of equipment being introduced, this process is only recommended for individual or small numbers of equipment entry.

2. The same process above is followed for minor O&M projects and undocumented equipment identified at UH with one exception. Due to the familiarization of the O&M personnel with the equipment, the systems it serves and the CMMS, they are asked to complete the top portion of the PM Minor Project Equipment Form.

IV New Equipment and Preventive Maintenance Task Development

The process in which new equipment and preventive maintenance tasks are developed and deployed at UH follows these general steps:

1. New Equipment Addition: New equipment is first assessed as to its ownership, how it will be used, the functionality of the building or location it will be supporting, and its APPA Impact Level. This assessment will determine whether the equipment should be added to the preventive maintenance system equipment inventory, if preventive maintenance is warranted, and to what degree.

a. If it is determined that the equipment should be added and matches with existing equipment in the CMMS, a standard equipment abbreviation is applied to it and a unique equipment tag number is created using the method described in the Section I Overview, Sub-Section 2. Data Structure.

b. If it is determined that the equipment should be added and does not match with existing equipment in the CMMS, a unique equipment abbreviation will be determined and the Equipment Abbv spreadsheet will be updated in the PM Master Equipment and Task Lists

workbook. The new equipment abbreviation will then be applied to it and a unique equipment tag number created as above.

2. Task Assignment: If the determination is made that the new equipment added into the CMMS warrants preventive maintenance, the below steps are taken.
 - a. If it is determined that the new equipment added matches with existing equipment in the CMMS and serves in a similar capacity, matching task codes are assigned to the new equipment.
 - b. If it is determined that the new equipment added does not match with existing equipment in the CMMS, new tasks are developed to address the type and frequency of maintenance needed.
3. New Task Development: If the determination is made that new tasks need to be added into the CMMS, the below steps are taken.
 - a. Using the equipment O&M manuals, trade experience and industry best practices, a determination is made on what preventive maintenance tasks should be done and how often. The tasks are then grouped by frequency and trade.
 - b. Task sheets are then created that contains the tasks to be perform at the same frequency and by the same trade. A task sheet should be formatted to contain the following sections: Task Code, Frequency, Application, Special Instructions, Tools / Equipment / Materials Required, PM Tasks. The PM Basic Task Sheet Template (Exhibit 7) and PM Major Task Sheet Template (Exhibit 8) documents have been created to assist in the formatting of the task sheet and are located in the \PM Templates and Forms\ folder.
 - c. Once the Task Sheets are created, a unique task code is created for each task sheet using the method described in the Section I Overview, Sub-Section 2. Data Structure. It is beneficial if the last three digits assigned to a new task code can match with other task codes of different frequencies for the piece of equipment (i.e. AHUCs have a 5M005 and 6M005)
 - d. The new task codes are then added to the task sheets and update on the Master Task Code List spreadsheet in the PM Master Equipment and Task Lists workbook.
 - e. In updating the task code spreadsheet, the task description, man-hour required to do the work, type of trade involved, and frequency are also required.
 - f. Once the information above has been developed, the new tasks can be entered into CMMS using the CMMS New Task Entry document (Exhibit 9). The new task codes are now available to be applied to the new equipment using the CMMS Equipment and PM Task Entry document.

V Labor Standard and Cost Estimates Determination

The Labor Standard (Est. Time) for PM task codes that have been developed for UH are listed in the PM Master Equipment and Task Lists workbook under the Labor Std. column in the Master Task Code List spreadsheet. The initial Labor Standard for each task code was determined using the knowledge and experience of O&M managers, trade supervisors, senior technicians and the RS Means estimating guide. As the task is repeatedly performed over the course of time, CMMS summarizes the time applied to that task and calculates an average time that is displayed on the Task Record as “Average Time (hrs.)”. This information is periodically reviewed and adjustments made to the Labor Standard for the task code.

Annual Cost Estimates for preventive maintenance are determined by multiplying the task’s Labor Standard or Average Time (whichever is greater) by the frequency in which it is performed each year and applying the appropriate Shop Rate that would be performing the maintenance. This information is

PM EQUIPMENT QUESTIONNAIRE

Equipment Category: Fire Protection Systems

Equipment Type: Fire Alarm Panel

Building: #551 Science & Research 2

Equipment Preventative Maintenance Schedule: (Select all that apply)

- Week
- Month
- Quarterly
- Semi-annual
- Annual

Lead Days:

Number of days from beginning to completion of work: _____

Number of days before work can begin once scheduled: _____

Primary Labor Crew:

- AUTO SHOP
- DINING CREW
- ELECTRICAL CREW
- ELEVATOR CREW
- FIRE ALARM CREW
- GENERAL MAINTENANCE CREW
- GROUNDS CREW
- HVAC CREW
- LOCK SHOP CREW
- MOVES & EVENTS CREW
- CENTRAL PLANT CREW
- SOLID WASTE CREW

Primary Labor Requirements size:

Primary Estimated hours:

PM Task List

Row Labels
AIR HANDLING UNIT, 3 TONS THROUGH 24 TONS
D30451101950 : AIR HANDLING UNIT, 3 TONS THROUGH 24 TONS QUARTERLY: CHECK WITH OPERATING OR AREA PERSONNEL FOR DEFICIENCIES. CHECK CONTROLS AND UNIT FOR PROPER OPERATION. CHECK FOR UNUSUAL NOISE OR VIBRATION. CHECK TENSION, CONDITION AND ALIGNMENT OF BELTS, ADJUST UNALIGNED BELTS. LUBRICATE SHAFT AND MOTOR BEARINGS. INSPECT COILS FOR CLEANING, REPORT DEFICIENCIES. REPLACE AIR FILTERS. CLEAN DRAIN PAN, ADD DRAIN PAN TABS, CLEAN DRAIN LINE. INSPECT EXTERIOR PIPING AND VALVES FOR LEAKS; TIGHTEN CONNECTIONS AS REQUIRED. CLEAN AREA AROUND EQUIPMENT. FILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES. TURN UNIT BACK ON.
0.42 PREVENTIVE 3 M
HVAC A/C SPLIT SYSTEM, DX AIR COOLED, UP TO 10T QUARTERLY PM
D30552501950 : AIR CONDITIONING OUTDOOR SPLIT SYSTEM, DX, AIR COOLED, UP TO 10 TONS QUARTERLY: CHECK WITH OPERATING OR AREA PERSONNEL FOR DEFICIENCIES. CLEAN INTAKE SIDE OF CONDENSER COILS, FANS AND INTAKE SCREENS. LUBRICATE SHAFT AND MOTOR BEARINGS. REPLACE AIR FILTERS. PERFORM OPERATIONAL CHECK OF UNIT; MAKE ADJUSTMENTS ON CONTROLS AND OTHER COMPONENTS AS REQUIRED. DURING OPERATION OF UNIT, CHECK REFRIGERANT PRESSURE; ADD REFRIGERANT AS NECESSARY. CLEAN AREA AROUND EQUIPMENT. FILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES. TURN UNIT BACK ON.
0.61 PREVENTIVE 3 M
D30552501950 : AIR CONDITIONING SPLIT SYSTEM, DX, AIR COOLED, UP TO 10 TONS QUARTERLY:
CHECK WITH OPERATING OR AREA PERSONNEL FOR DEFICIENCIES. CLEAN INTAKE SIDE OF CONDENSER COILS, FANS AND INTAKE SCREENS. LUBRICATE SHAFT AND MOTOR BEARINGS. REPLACE AIR FILTERS. PERFORM OPERATIONAL CHECK OF UNIT; MAKE ADJUSTMENTS ON CONTROLS AND OTHER COMPONENTS AS REQUIRED. DURING OPERATION OF UNIT, CHECK REFRIGERANT PRESSURE; ADD REFRIGERANT AS NECESSARY. CLEAN AREA AROUND EQUIPMENT. FILL OUT MAINTENANCE CHECKLIST AND REPORT DEFICIENCIES. TURN UNIT BACK ON.
0.61 PREVENTIVE 3 M
HVAC AC WINDOW UNIT QUARTERLY PM
HVAC AC WINDOW UNIT QUARTERLY: CHECK CONTROL AND UNIT FOR PROPER OPERATION. CHECK AIR FILTER. PLUG FEEDING UNIT. TURN UNIT BACK ON.
0.5 PREVENTIVE 3 M
HVAC AC WINDOW UNIT QUARTERLY:
CHECK CONTROL AND UNIT FOR PROPER OPERATION. CHECK AIR FILTER. PLUG FEEDING UNIT. TURN UNIT BACK ON.
0.5 PREVENTIVE 3 M

Master Equipment Abbv List – \PM Master Lists\PM Master Equipment and Task Lists.xlsx

Master Equipment Abbv List

LEGEND:			
			New/Add/Modification
			Duplicate
			Removed/Deactivated
			Under Review
Equipment	Abre Tag #	Description	Definition
193943	193943	Fan Blower	
1949675	1949675	Advance Aqua Clean Flex Extractor	
85002034	85002034	Super Coach HEPA Pro Vacuum Back pack	
A/C	A/C-BSE-1	AIR CONDITIONER	
AC	AC-AET-001	AIR COMPRESSOR	
ADT	ADT-BSB-10	ACID DILUTION TANK	
AFU	AFU-SC-001	Air Filter Unit	Only air filtration recycled within a space to remove particulate.
AHU	AHU-ARTS-48-RAF	AHU-ARTS-48-RETURN AIR FAN	
AHUC	AHUC-AET-001	AHU #1 SOUTH BLDG	Air Handler Unit - Chilled water fed
AHUD	AHUD-AET-001	AHU# 11 SERVES IDF	Air Handler Unit-DX unit, For Split Systems: Include both CU and Air Handler/Evaporator
AHUP	AHUP-PW-001	Air Handler Unit Package: Wall Mount	Air Handler Unit Package: Wall Mounts or package units
AIRCOM	AIRCOM-LSL-1	AIR COMPRESSOR	Air compressor unit.
AIRDRY	AIRDRY-PP-1	COMPRESSED AIR DRYER	Air dryer for compressed air distribution. Duplicate of CAD
ALG	ALG-ARTS-001	LIFT GATE ARTS ADDITION	
ANT	ANT-BSB-1	ACID NEUTRALIZATION TANK	
ARG	ARG-AET-001	SERVICE DRIVE AET/BSE	
AS	AS-BSE-001	AIR SEPARATOR O/D TAG 092	
ASD	ASD-AET-001	AUTOMATIC SLIDING DOOR	

Master Task Code List - \PM Master Lists\PM Master Equipment and Task Lists.xlsx

Master Task Code List

LEGEND					
					CHANGE MADE IN THE TASK CODE
					NEWLY CREATED PM
					REMOVED FROM SERVICE OR COMBINED WITH ANOTHER JOB CODE TASK LIST.
					APPA 1
					APPA 2
					APPA 3
					APPA 4
CODE	DESCRIPTION	Labor Std	SHOP	FREQ PER YEAR	
3M195	1 MONTH AIR COOLED FILTER MEDIA CHANGE ICE MACHINES	0.25	M	12.00	
5P160	6 MONTH PM NAT GAS PRESSURE REGULATOR (CAPTURED IN CONTRACT FOR NATURAL GAS TESTING)	1.00	P	2.00	
5P166	6 MONTH PM EMERGENCY NAT GAS SHUT OFF	1.00	P	2.00	
2A180	1 WEEK FUEL CHECK FOR AVP VEHICLE TOYOTA HYBRID AUTO-160	0.50	A	52.00	
3G071	2G071 - Weekly Trash Maintenance (SLA ACCOUNTS ONLY) - FOR BILLING PURPOSES OF GROUNDS WORK	1.00	G	52.00	
3G075	2G075 - Weekly Turf Mowing (SLA ACCOUNTS ONLY) - FOR BILLING PURPOSES OF GROUNDS WORK	1.00	G	52.00	
2M138	1 WEEK PM DECORATIVE FOUNTAIN	0.50	M	52.00	
2O179	DAILY MECHANICAL INSPECTIONS (APPA 2)	0.25	O	52.00	
2O190	DAILY SOFT WATER TESTING (APPA 2)	0.50	O	52.00	
2P049	1 WEEK PM WATER SOFTENER (APPA 2) (Change labor to 1.0 hrs 3/13/14)	1.00	P	52.00	
3A181	MONTHLY BATTERY CHECK ON ELECTRIC GOLF CARTS (NOT CURRENTLY SCHEDULED IN TMA)	0.50	A	12.00	
3C193	MONTHLY PM CONDUCTED WEEKLY: INSPECTION OF TILED SURFACE ON ELEVATED WALKWAY	0.75	C	12.00	
3E145	1 MONTH PM SWIMMING POOL ELECTRIC (APPA 1)	2.00	E	12.00	
3E185	1 MONTHLY OIL FILLED TRANSFORMER INSPECTION REQUIRED BY SAFETY (APPA 1)	1.50	E	12.00	
3F301	1 Month Fire Pump Churn Test	1.00	F	12.00	
3G080	3G080 - Monthly Plant Bed Maintenance (SLA ACCOUNTS ONLY) FOR BILLING OF GROUNDS WORK	1.00	G	12.00	
3G086	3G086 - Monthly Pest Control	1.00	G	12.00	
3G087	3G087 - Monthly Herbicide Maintenance	1.00	G	12.00	
3G088	3G088 - Monthly Test / Inspection Irrigation System Maintenance (APPA 1)	1.00	G	12.00	
3G175	1 MONTH PM WATER QUALITY BASIN (APPA 1)	0.50	G	12.00	

CMMS Equipment and PM Task Entry - \PM Program Development\

Web AiM Equipment and PM Task Entry

The following processes provided the necessary selections to enter new equipment and apply PM tasks to it.

Add Equipment

Note: You can select a like piece of equipment to the new one and select Copy. This will also allow you to copy all the associated PM Tasks for that type of equipment. Make necessary changes unique to that piece of equipment and SAVE. You must go back to the Tasks and make changes to Account, Schedule, etc...

- Organization
- Equipment
- Add
- Tag #
- Description
- Location ID (Building Abbv.-Room Number. If not available, contact the UTSA TMA Administrator to add a missing area.)
- Type Desc.
- Account #
- Select Repair Center tab
- Add Repair Center
- Check Repair Center (Where the equipment resides)
- Select Identity to double check entries.
- Save**

PM Task Schedule

Note: If you used the Copy selection to enter a new piece of equipment, ensure the Account and Schedule are reviewed and modified if necessary.

- Organization
- Task

PM Minor Project Equipment Form - \PM Templates and Forms\

PM Minor Project Equipment Form

Requestor:	Contact No:	Date:
New Equipment Data		
1. Equipment Replacement	<input type="checkbox"/> New (Complete 1 through 13) <input checked="" type="checkbox"/> Replacement (Complete 1 through 15)	
2. Project Name and WO #		
3. Project Completion Date		
4. Equipment Label / Tag		
5. Equipment Description		
6. Equipment System		
7. Model Number		
8. Serial Number		
9. Manufactrer		
10. Building		

PM Basic Task Sheet Template - \PM Templates and Forms\PM Task Sheet Templates\

PM Basic Task Sheet Template

Task Code: 3M151 (APPA4)

Frequency: 1 MONTH

Application: This PM applies to independent compressed air filter units.

Special Instructions:

1. Review manufacturer's maintenance instructions.
2. Follow established procedures for communication of equipment maintenance.
3. Follow all applicable safety procedures.
4. Follow all applicable environmental requirements in handling material disposal.

Tools / Equipment / Materials Required:

1. Standard Tools - Basic.

PM Tasks:

1. Inspect compressed air filter housing, hoses and connections for any signs of damage, leaking or looseness.
2. If applicable, inspect sight glasses for signs of moisture or contamination build-up.
3. If equipped with auto-blowdown feature, test feature and blow down contaminations.
4. If equipped with manual blowdown valve, ensure drain line is available and directed to a drain. Manually open filter valve to blow out moisture and contamination from the air filter until clear.
5. Close valve and ensure there is no residual leak-by from the drain line.
6. Note any discrepancies found and initiate a repair work order.

Major Task Sheet Template - \PM Program\PM Templates and Forms\PM Task Sheet Templates\

PM Major Task Sheet Template

Task Code: 4M154 (APPA2)

Frequency: 3 MONTH

Application: This PM applies to stationary vacuum system units including multiple pumps operated by a lead-lag controller. The scope includes the pump(s), the vacuum storage tank, and the lead-lag controller. The annual PM for vacuum system units is covered by Task Code 6M154. Annual PM for electric motors is covered by Task Code 6E091.

Special Instructions:

1. Review manufacturer's maintenance instructions.
2. Follow established procedure for communication of equipment maintenance.
3. Follow all applicable safety procedures.
4. Follow all applicable environmental requirements in handling material disposal.

Tools / Equipment / Materials Required:

1. Hand-tools and Flashlight.
2. Pump oil and filter as required.
3. Grease gun and grease as required.
4. Infrared Heat Gun or Contact Thermometer.

PM Tasks:

Tasks 1-8 apply to vacuum system when running. Note these tasks may require the other vacuum pumps be de-energized to assure the pump being inspected continues to run. In this event, ensure that adequate vacuum is being maintained.

1. Measure and record bearing temperatures using infrared heat gun or contact thermometer. Hold heat gun within 2 inches of bearing housing to measure temperature.
2. If seal is visible, measure and record temperature at seal face using infrared heat gun or contact thermometer. Hold gun within 2 inches of seal face.
3. Observe for excessive noise and vibration of pump, motor and drive coupling.
4. Observe for water and vacuum leaks.
5. Inspect each pump for leaks in seals, valves, gaskets, etc.
6. Inspect pump exhaust system for clogged filter elements or burned oil. This is indicated by smoke and oil mist coming from the exhaust, high motor current, or if equipped with a pressure gauge, note if it is indicating high pressure. If filter elements have begun to clog, change exhaust filter elements.
7. For liquid ring vacuum pumps, observe water flow from pump to verify adequate flow rate.
8. For liquid ring vacuum pumps, flush Y strainer to remove debris.

Tasks 9-17 apply to vacuum pumps when off.

9. Note level of oil in system. If there is a significant drop in oil level, observe for leaks or broken exhaust filter.
10. Note color of oil in system. If the oil is dark colored, a thorough flushing may be required.
11. Drain oil from hot pump and containerize for appropriate disposal.

CMMS New Task Entry - \PM Program\PM Program Development\

Web AiM New Task

The following process provided the necessary selections to enter new PM tasks in WebTMA.

Add New Task

Note: You can select a like task to the new one and select Copy. Make the necessary changes unique to the new task and SAVE. Ensure you make changes to Account, Schedule, etc...

- Organization
- Task
- Record
- Add
- Code (Enter new unique task code)
- Description (Enter task code description)
- Type (Enter "PM")
- Labor Standard (Enter man-hours)
- Select Task Sheet tab
- Copy new Task Sheet text from modified template and paste in text box. (Spacing will need to be corrected)
- Select Repair Center
- Add Repair Center
- Select correct Repair Center and SAVE Repair Center
- SAVE Task

CMMS PM Forecast

WebTMA PM Forecast Sample Report

Itemtype_name	Number of Occurrences	fo_code	FirstOfffo_description	tagnumber	fu_unittid	fr_code	cst_name	cst_code	Total Hours
Equipment	2	2G071	2G071 - WEEKLY TRASH MAINTENANCE	LS-ZONE8A-001	CAMPUS-Zone 8	Blue Roads & Grounds	FACILITIES GROUNDS	DXM049	16
Equipment	2	2G075	2G075 - 1 WEEK TURF MOWING	LS-ZONE8A-001	CAMPUS-Zone 8	Blue Roads & Grounds	FACILITIES GROUNDS	DXM049	12.58
Equipment	9	2M138	2M138 - 1 WEEK PM DECORATIVE FOUNTAIN	FOU-AET-001	AET-WATER FOU	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	28.8
Equipment	9	2M138	2M138 - 1 WEEK PM DECORATIVE FOUNTAIN	FOU-BSB-001	BSB-FOUNTAIN	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	28.8
Equipment	9	2M138	2M138 - 1 WEEK PM DECORATIVE FOUNTAIN	FOU-JPL-001	JPL-FOUNTAIN	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	28.8
Equipment	9	2M138	2M138 - 1 WEEK PM DECORATIVE FOUNTAIN	FOU-UC-001	UC FOUNTAIN	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	28.8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WS-RRC-001	RRC-1.002	Preventive Maint. Team	MEAL PLAN	AX0019	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-ARTS-001	ARTS-1.00.46	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-BB-001	BB-1.00.08	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-BB-002	BB 2.01.04	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-CDC-1	CDC-1.112	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-DB-001	DBB-0.310	Preventive Maint. Team	DT FACILITIES OPS MAINT	DXM043	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-JPL-001	JPL-1.00.37	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-MB-001	MB-8.206	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-MS-001	MS-1.00.18A	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-NPB-001	NPB-1.008	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-PE-001	PE-1.02.04B	Preventive Maint. Team	ATHLETICS	AX0110	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-PNB-001	GSR-1.006	Preventive Maint. Team	FACILITIES OPS MAINT	DXM048	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-RWC-001	RWC-0.100A	Preventive Maint. Team	CAMPUS RECREATION CENTER	AX0009	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-UC-001	UC-1.00.23	Preventive Maint. Team	FOOD SERVICE RETAIL OPERATIONS	AX0020	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-UC-002	UC-1.00.10A	Preventive Maint. Team	FOOD SERVICE RETAIL OPERATIONS	AX0020	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-UC-003	HUC-0	Preventive Maint. Team	ATHLETICS	AX0110	8
Equipment	8	2P049	2P049 - 1 WEEK PM WATER SOFTENER (APPA 2)	WSU-UC-004	UC-1.00.48	Preventive Maint. Team	FOOD SERVICE RETAIL OPERATIONS	AX0020	8
Equipment	2	3C012	3C012 - 1 MONTH AUTOMATIC SLIDING DOOR INSPECTION	ASD-AET-001	AET-1.100A	OPERATIONS TEAM	FACILITIES OPS MAINT	DXM048	0.92