

***STANDING
OPERATING
PROCEDURES
(SOP)***

***For University of Guam Plant
Maintenance Division***

STANDING OPERATING PROCEDURES (SOP)

For University of Guam Plant Maintenance Division

INTRODUCTION:

To establish an **effective, efficient and workable** general Standing Operating Procedure (SOP) that is reasonably achievable and prioritize each Maintenance Work Order Request (MWOR) that is acceptable **with limited resources available by** both the UOG requester and the maintenance department.

RESPONSIBILITIES

1. The Plant Maintenance Division: Is established directly under the Vice President of Administration and Finance (VPAF) who has overall command responsibility for maintenance operations.

2. The Chief Plant and Facilities Officer (CPFO): Is responsible directly to the Vice President of Administration and Finance overall operation and function of the maintenance section and will continuously advise and keep the VPAF informed on the status of all maintenance operations. The CPFO will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the CPFO will:

3. The Building Maintenance Superintendent (BMS): Is responsible directly to the Chief Plant and Facilities Officer overall operation and function of the maintenance section and will continuously advise and keep the CPFO informed on the status of all maintenance operations. The BMS will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the BMS will:

Responsible for facilities and plant operations, maintenance and security such that physical resources and operations are effectively aligned with institutional purposes and educational objectives, and are sufficiently developed to support and maintains the level and kind of educational programs offered. I assist the CPFO in operating and maintaining over \$100 million of physical assets (replacement value) within a budget of over \$4.3 million. The position manages approximately 40 staff. Direct reports will include building and plant maintenance supervisors, a buyer and an outsourced security function. Major duties and responsibilities include, but not limited to the following:

- manage campus plant and facility operations to effectively deliver building maintenance, custodial, grounds, carpentry, HVAC, electrical, plumbing and mechanical services that support the University's academic, research and service needs
- interact with academic deans and directors to understand the academic needs for plant and facilities and to identify related operational priorities, service/ performance/ accreditation standards, workmanship, cost and quality expectations
- direct the operation of the physical plant in compliance with applicable building, fire and life safety, ADA, occupational health codes, regulations, and standards
- administer the outsourced security contract and work closely with the University's safety inspectors to provide secure, safe and healthy learning and work environments
- ensure that work orders are processed and completed in a timely, cost-effective manner
- administer University-wide energy conservation programs
- develop and manage the implementation of continuous improvement plans
- manage the purchasing of parts, equipment and services and assist in the development of RFPs and bids
- plan, assign, supervise, coordinate, inspect and evaluate the work of subordinates in accordance with University needs and

administrative and personnel polices

- serve as the University's representative and advocate to the Gov Guam homeland security and Recovery Activity Coordinator reporting to Civil Defense
- deliver the University's emergency response plan, when required, in concert with other government agencies
- provide on-site (including after normal working hours) management for plant and facilities in urgent situations/ emergencies (e.g., fire, flood, electrical, sewer) and severe weather (e.g., typhoons, earthquakes)
- operate and maintain all buildings and grounds for health, safety and beautification
- interact with external groups (i.e., union) in employment matters, as appropriate
- work as a team with the Coordinator, Campus Construction Projects in meeting campus infrastructure needs
- maintain records and prepare management reports related to assigned duties and responsibilities
- web master for the Administration and Finance department with administering a successful conversion to a computerized work order system
- perform other duties as assigned.

4. The Electrical Supervisor: Is responsible directly to the Building Maintenance Superintendent overall operation and function of the maintenance section and will continuously advise and keep the BMS informed on the status of all maintenance operations. The Supervisors will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the Electrical Supervisors will:

- Plans, supervises and participates in the installation, alteration, maintenance and repair of electrical mechanical systems, appliances and devices.
- Supervises and participates in the installation, alteration, maintenance and repair of electrical systems, appliances and devices.
- Establishes work schedules and practices; makes decisions regarding need for and extent of repairs to be made to systems and equipment.
- Makes time/material estimates; reviews work in progress and inspects completed jobs.
- Makes periodic inspection of electrical/mechanical systems, appliances and devices to determine adequacy of existing systems, repairs or replacements.
- Establishes, supervises & verifies records of repairs and operating expenses; inventory and replacement orders; and prepares/submit related reports.
- Keeps current with electrical/mechanical systems & equipment repair manuals, directives, warranties and manufacturer's instruction materials pertaining to the trade.
- Enforces agency policies for personnel, training and safety; recognizes & rectifies unsafe conditions; and plans work in accordance with accepted and recognized safety procedures and practices.
- Meets & confers with officials/contractors regarding electrical/mechanical equipment and maintenance programs, plans or problems.
- Performs related duties as required.

Lighting Foot Candles will be in accordance with the "ADEQUATE LIGHT LEVELS FOR YOUR WORKING OR AT YOUR WORK AREAS" (SEE BELOW CHART)

ADEQUATE LIGHT LEVELS FOR YOUR WORKING OR AT YOUR WORK AREAS																	
FT-CANDLE (lx)	1,000	500	300	200	150	100	75	50	30	20	15	10	7.5	5	3	2	
LOCATIONS																	
FACTORY				ELECTRONIC PARTS ASSEMBLY LINE • DRAFTING		TYPESETTING AT PRINTING SHOP • INSPECTION WORK		VISUAL WORK AT PRODUCTION LINE		PACKING WORK		EXIT ENTRANCE PASSAGE		INDOOR EMERGENCY STAIRS WAREHOUSE • LOADING OR UNLOADING WORK			
OFFICE				• TYPING • DRAFT- ING		CLERICAL WORK		CONFERENCE ROOM DINING ROOM RECEPTION ROOM		CORRIDOR, STAIRS.		ENTRANCE WARE- HOUSE.		INDOOR EMERGENCY STAIRS			
HOUSE				• SEWING.		• READING • STUDY		• MAKE-UP		• DINING TABLE		• RECREA- TIONAL ACTIV- ITIES.		• WASH- ING			
STORE				• FOREFRONT OF SHOW WINDOW.		• SHOW WINDOW • PACKING TABLE		ELEVATOR		• DISPLAY STAND		RECEPTION ROOM.		CORRIDOR STAIRS.		INDOORS	
HOSPITAL	EYE INSPE- CTION.					OPERATING ROOM EMERGENCY TREATMENT.		MEDICAL EXAMINATION ROOM DINNING ROOM.		WAITING ROOM		SICK ROOM, WARE- HOUSE		STAIRS.		EMERGENCY STAIRS	
SCHOOL							• DRAFTING ROOM • LABORATORY, LIBRARY.		CLASS ROOM.		INDOOR GYMNASIUM AUDITORIUM WASH ROOM.			EMERGENCY STAIRS			
RESTAURANT							• SHOW WINDOW.		COOKING ROOM. DINING TABLE		ENTRANCE. WASH ROOM.		CORRIDOR STAIRS.				
BABER BEAUTY PARLOR							• HAIR DYEING • MAKEUP • HAIR DRESSING.		• SHAVING • HAIR WASHING • DRESSING.								

5. The Air Conditioning & Refrigeration Mechanic Supervisor: Is responsible directly to the Building Maintenance Superintendent overall operation and function of the maintenance section and will continuously advise and keep the BMS informed on the status of all maintenance operations. He will Supervises and participates in the installation, maintenance and repair of refrigeration equipment in accordance with all existing regulations and directives. Additionally, the Air Conditioning & Refrigeration Mechanic Supervisor will:

- Leads a crew and performs skilled work in the installation, maintenance and repair of air conditioning/refrigeration equipment.
- Leads the work of a A/C & refrigeration mechanic crew; passes on to lower level mechanics the instructions received from the supervisor and completes work assignments; demonstrates proper work methods and procedures and proper use of tools and equipment. Maintains records such as individual work time; and equipment data records from thermostats and gauges; furnishes information regarding such matters as progress, production, personnel injury and costs; assures that materials, tools and equipment are available.
- Performs skilled tasks; reads A/C & refrigeration blueprints, diagrams and sketches and works directly from them; maintains current knowledge and answers questions of other workers on procedures and instructions; inspects work while in progress and upon completion to verify that supervisor's instructions on work sequence, procedures, methods, and deadlines have been met; ensures that safety and housekeeping rules are followed.
- Performs related work as required

6. The Building Maintenance Supervisor (Buildings): Is responsible directly to the Building Maintenance Superintendent overall operation and function of the maintenance section and will continuously advise and keep the BMS informed on the status of all maintenance operations. The Supervisors will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the Building Maintenance Supervisors (Buildings) will:

- Supervises and participates in skilled carpentry, plumbing and electrical work involved in the maintenance, alteration and repair of buildings.
- Supervises and participates in carpentry work involved in the maintenance, alteration and repair of buildings and installation, alteration, maintenance and repair of plumbing and electrical system, appliances, fixtures and related devices.
- Establishes work schedules and practices; makes decisions regarding need for & extent of repairs to be made.
- Directs the storage and maintenance of carpentry, plumbing and electrical supplies and equipment (non custodial/grounds) and ensures they are maintained and available for work projects; orders supplies, tools and equipment as needed.
- Estimates the time and material costs for work projects.
- Interprets and works directly from blueprints, sketches and diagrams.
- Confers with administrators on building maintenance problems and programs.
- Applies and enforces safe work practices on the job.
- Maintains records and prepares reports.
- Implements agency policies for personnel, training and safety of subordinates.

7. The Building Maintenance Supervisor (Custodial/Grounds): Is responsible directly to the Building Maintenance Superintendent overall operation and function of the maintenance section and will continuously advise and keep the BMS informed on the status of all maintenance operations. The Supervisors will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the Building Maintenance Supervisors (Custodial/Grounds) will:

- Supervises and participates in maintaining the routine custodial services and related minor repair of buildings; in maintaining the routine grounds services for the university campus.
- Supervises and participates in the maintenance, minor alteration and minor repair of buildings; and maintenance of the campus grounds and coordinating necessary repairs/maintenance of custodial/grounds equipment .
- Establishes work schedules and practices; makes decisions regarding need for & extent of repairs to be made.
- Directs the storage and maintenance of custodial/grounds supplies and equipment and ensures they are maintained and available for work projects; orders supplies, tools and equipment as needed.
- Estimates the time and material costs for work projects.
- Interprets and works directly from work orders.
- Confers with administrators on custodial, and grounds related problems and programs.
- Applies and enforces safe work practices on the job.
- Maintains records and prepares reports.

- Implements agency policies for personnel, training and safety of subordinates.
- Performs related duties as required.

8. The Employees: Is responsible directly to the Supervisor overall operation and function of the maintenance section and will continuously advise and keep the Supervisor informed on the status of all maintenance operations. The Supervisors will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the Employee will:

9. The Requestor: Is responsible directly to the Supervisor overall operation and function of the maintenance section and will continuously advise and keep the Supervisor informed on the status of all maintenance operations. The Supervisors will ensure that maintenance operations are in accordance with all existing regulations and directives. Additionally, the Employee will:

10. The Buyer I : Is responsible for Providing support to the UOG Plant Maintenance Division in the form of supplies, materials, & coordinating with contractors. Our objective is to consistently obtain goods and services at the best possible price.

Plant Maintenance Supply Office

Daily:

- Issue supplies and materials to maintenance employees
- Coordinate with Supervisors to set priorities
- Update Maintenance Superintendent on set Priorities
- Call for or fax price quotations
- Process purchase orders request
- Expedite Purchase Orders
- Process invoices for payment (Receiving Reports)
- Maintain Holding Areas
- Maintain Records of all transactions
- Maintain Vehicle Gas Cards
- Coordinate vehicle service & repairs

Requesting for Supplies & Materials:

Requestor needs to fill out a supply requisition form and insure all information is provided on the requisition before submitting to the supply office.

1. Complete description and Quantity of the supplies or materials needed.
2. Location where items are to be used.
3. Work Order Number must be indicated on the requisition form. A copy of the work order should also be attached to the requisition.
4. Requisition must be signed by the requestor's immediate supervisor.
5. When the supply office issues the items, the requestor must sign the requisition form "Received". This is the final step and documents the entire process.

Supply Requisition:

This form is used to request & order materials needed to complete assigned work

B. Reusable PPE: Are items that are designed for Long-term use. These items are signed out by the employee and placed in their personal jacket. These

items are expected to be returned to the supply office if damaged and need replacing or if the employee no longer needs the item.

Ex: Hard Hat, Back Support, Safety Glasses, Face Shields, Safety Shoes, Rain Coat, Body Harness, etc.

Safety Shoes:

1. Each maintenance employee is entitled to one pair (1pr.) of safety shoes per Fiscal year, unless damaged due to normal use that warrants replacement.
2. It is the responsibility of the employee to ensure they choose a safety shoe that is appropriate to their Job description.
Ex: Electricians: Electrical Hazard rating, Carpenters: Puncher Proof Sole, Ect.
3. The limit for safety shoes is set at \$125.00. Any amount exceeding \$125.00 is The employee's cost.

Hand Tools & Power Tools:

1. All tools intended for long-term use will be signed out by the employee and placed in their personal Jacket held in the Supply Office.
2. Tools not used on a daily basis or shared by a crew will be signed out by the Supervisor.
3. All employees are responsible for the tools they sign out for and will be held responsible for ensuring the tools are maintained in safe operating condition.
4. Any damaged or lost tools must be reported or returned to the supply office as soon as possible

Petty Cash:

1. Petty Cash is used only in an emergency or a vendor doesn't accept Government Purchase Orders.
2. Authorization for use of petty cash must be pre-approved by the Maintenance Superintendent.
3. Petty cash limit per receipt is \$150.00
4. Supply requisition must be accompanied with receipt. With work order and location. This documents and justifies the use of petty cash.

OPERATIONS

1. Online Maintenance Work Order Request (MWOR) System

PURPOSE

To provide a maintenance process from requestor to completion and close out by the numbers as part of improving the maintenance management process.

MAINTENANCE PROCESS

1. Authorized requestor prepares maintenance work order request (MWOR).
2. Logged into the automated computer helpdesk system and sent out.

3. Request is received by the Building Maintenance Superintendent.
4. BMS reviews and determines what category the request would fall under, see list of categories below
 - If it is determine to be an **IMMEDIATE** it is immediately assign and acted on without delay.
 - If it is determine to be a **HIGH** priority it is assign and acted on within a 24 hour period.
 - If it is determine to be a **MED** priority it is assign and acted on within a 48 hour period.
 - If it is determine to be a **LOW** priority it is assign and scheduled based on/or a combination of the following:
 - a. Materials needed or ordering of materials
 - b. Labor extensive interfering with academic instructions
 - c. Lack of/or identifying funding to support the request
 - d. Minimal resources that requires outsourcing
 - e. Typhoon related damages awaiting FEMA funding
 - f. Extremely extensive characterizing it as a Capital Outlay Plan or Deferred Maintenance Plan
5. BMS assign a work order number to the request and sends it out to the appropriate Supervisor/Planner.
6. Supervisors communicates with the requestor and act on Emergency, High, and Med priority in that order.]
7. For Low priority there is a series of steps that needs to takes place:
 - a. Supervisor communicates with the requestor to clarify the request.
 - b. Supervisor puts together a plan and material listing due to the absence of a maintenance planner/estimator.
 - c. Supervisor reports back to the BMS with his findings and to receive additional instructions and / or approval/disapproval to continue.
 - d. If approved the material listing is then given over to the supply office for processing.
8. For Low priority there is a series of steps that needs to takes place:
 - a. Supervisor communicates with the requestor to clarify the request.
 - b. Supervisor puts together a plan and material listing due to the absence of a maintenance planner/estimator.
 - c. Supervisor reports back to the BMS with his findings and to receive additional instructions and / or approval/disapproval to continue.
 - d. If approved the material listing is then given over to the supply office for processing.



UNIVERSITY OF GUAM
UNIBETSEDAT GUAHAN
MAINTENANCE WORK REQUEST
PLANT MAINTENANCE DIVISION
 U.O.G. Station, Mangilao, Guam 96913
 Phone: 735-2385/76 Fax: 734-8918 E-Mail: ftroy@guam.uog.edu

EMERGENCY MAINTENANCE REQUEST PROCEDURE
 (KEEP NEAR THE PHONE)

IN AN EMERGENCY, CALL THE ABOVE CONTACT NUMBERS AND GIVE THE INFORMATION IN THE SEQUENCE SHOWN BELOW.

1. Caller name and phone number. Is safety involved?
Mary M. Perez, 735-2332 No
2. Department where work is needed.
Learning Resources, RFK Library
3. Machine or equipment type and location.

Door Knob of Conference Room #2, 2nd floor.

4. Describe the problem and what may be causing it.
Can't open conference room because of a broken key in the keyhole.
 5. Describe work requested and priority.
Please disengage broken key --- Needed
 6. When can the work be done?
[] Now [X] Later, Time _____ [] Other: Explain (i.e. during semester break.)
 7. When must the work be completed?
At your earliest possible; students, on a daily basis, use conference room. This will hamper its availability until fixed.
 8. What maintenance craft is needed? ?
☐ Electrical ☐ PM ☐ AC ☐ Other _____
 9. How did the problem happen?
When trying to unlock the conference room the key broke in half. The broken half is submerged in the keyhole.
 10. If minor, have you tried to fix it? What happened? N/A
-

Note: An emergency is a situation in which an unscheduled shutdown of needed equipment has occurred or is imminent due to danger of injury to personnel, critical loss or possibility of canceling classes.

2. Preventive Maintenance Checks & Service (PMCS)

The frequency for the maintaining of AC systems and their associated equipment/components should be done in accordance with manufacturer specifications or as prescribed below: A standard log book should be initiated in order to provide technicians with historical of any AC system or unit being serviced and maintained.

Pedro Benito

SOP / Daily Routine

Check every morning the following Buildings.

- | | | |
|---|--------------------|----------|
| 1. Science / planetarium main a/c unit. | 2. Health science. | 3. Class |
| 4. EC | 5. Lecture hall | 6. CNAS |
| 7. Computer ctr. | 8. RFK | 9. SOE |
| 10. L.G. bldg | 11. MARC / PDLC | |

Check main a/c units for proper operation.

Check for open trouble calls and assign a/c crew to respond as per priority.

Schedule projects and installations with customers.

Fill – out material request forms and obtain price quotations for parts and materials.

Input data, assign, and close work request on maintenance connection on a daily basis.

Provide a/c crew with parts, materials, equipment to complete task assigned.

Provide proper Personal Protective Equipment (PPE) for a/c crew to accomplish job safely.

Coordinate with contractors as per scope of work.

Assure and inspect work of contractors as to complete work on a timely manner and to follow scope of work.

Assure employees accomplish mission of UOG and to provide a safe working environment.

Basic Maintenance Check List:

- ⊕ Inlet Filter Cartridges: Inspect and clean or replace per manufacturer specifications. Required frequency is often related to operating conditions. Dirty filters increase energy consumption. (Bi-weekly)
- ⊕ Drain Traps: Clean out debris and check operation periodically. (Weekly)
- ⊕ Compressor Lubricant Level: Inspect daily and top off or replace per manufacturer specifications. Change lubricant filter per manufacturer specifications. (Monthly)
- ⊕ Air Lubricant Separator (Lubricant –inject Rotary Screw Compressors): Change per manufacturer specifications, or when pressure drop exceeds 10 psid, which ever is less. (Monthly)
- ⊕ Lubricant Selection: Select compressor and electric motor lubricant per manufacturer specifications. (Prior to replacement)
- ⊕ Belt Condition: Check belts for wear and check/adjust tension per manufacturer specifications. (Monthly)
- ⊕ Operating Temperature: Verify that operating temperature is per manufacturer specification. (Weekly)
- ⊕ Air Line Filters: Replace particulate and lubricant removal elements when pressure drop exceeds 2 to 3 psid. Inspect all elements at least annually regardless of pressure drop indication. (As needed)
- ⊕ Water Cooling System: For water-cooled systems, check water quality (especially pH and total dissolved solids), flow, and temperature and clean/replace filters and heat exchangers per manufacturer specifications.
- ⊕ System Leaks: Check lines (especially joints), fittings, clamps, valves, hoses, disconnects, regulators, filters, lubricators, gauge connections, and end-use equipment for leaks. (Monthly)
- ⊕ System Cleanliness: Check system for compressor and motor lubricant leaks and cleanliness. (Monthly)

ACCU and condensing coils will be cleaned monthly. Unit will be taken off line and the following method be utilized to clean the coils. Use a pressurized water system or high pressure hose of some sort (at least 30psi) to shoot a spray of water through the coils in order to remove any build up of debris and other components detrimental to the health of the unit. Coils should be clean enough to see through them or water should be able to penetrate without any restrictions.

HERE BELOW IS SOME CHECK LIST FROM MANUFACTURE SPECICATIONS:

J.O.# _____ ACT. _____		PMI CHECKLIST AIR HANDLER/FAN COIL UNIT CHILL WATER		SCHEDULED DATE: _____ DATE PERFORMED: _____	
TASK NO: _____		PERFORMED BY: _____			
BLDG: _____ LOCATION: _____		EQUIP. NO. _____			
DESCRIPTION OF WORK		WORK PERFORMED			
		N/A	YES	NO	
MONTHLY					
1. FLUSH CLEAN AND DRY WASHABLE AIR FILTERS.					
2. CHECK, ALIGN, ADJUST OR REPLACE DRIVE BELTS.					
3. INSPECT UNIT FOR EXCESSIVE NOISE, VIBRATION OR HEAT.					
4. CLEAN UP AREA AROUND UNIT; SWEEP AND PICKUP DEBRIS.					
5. CHECK MODUTROL VALVES FOR PROPER OPERATIONS.					
6. CHECK TEMP./PRESS. GAUGES FOR PROPER OPERATING CONDITIONS. RECORD READINGS. TEMP. IN _____ OUT _____ PRESS. IN _____ OUT _____					
QUARTERLY					
1. WIPE CLEAN EXTERIOR OF UNIT.					
2. WIPE CLEAN EXTERIOR OF MOTOR.					
3. REPLACE DISPOSABLE AIR FILTERS.					
4. CHECK AND CLEAN MAGNETIC CONTACTOR.					
5. LUBRICATE MOTOR AND BLOWER BEARINGS.					
6. CLEAN EVAPORATOR DRIP PAN AND CLEAR DRAIN LINES.					
7. CHECK AND RECORD EQUIPMENT FOR PROPER VOLTAGE AND AMPERAGE. VOLTAGE: _____ AMPERAGE: _____					
8. INSPECT FOR OIL, WATER, REFRIGERANT OR AIR LEAKS. TIGHTEN LOOSE CONNECTIONS.					
9. CHECK ELECTRICAL WIRING/CONTROLS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.					
10. EXERCISE WATER VALVES AND VOLUME DAMPERS.					
DEFICIENCY: _____					
REVIEWED BY: _____ DATE: _____					

SHEET ____ OF ____ .

J.O.# _____

PMI CHECKLIST

SCHEDULED DATE: _____

ACT/ _____

CHILL WATER PUMP

DATE PERFORMED: _____

FREQUENCY: QUARTERLY

PERFORMED BY: _____/_____

BLDG.	LOCATION:	EQUIP.NO.	WORK PERFORMED		
DESCRIPTION OF WORK			N/A	YES	NO
1. LUBRICATE MOTOR AND PUMP BEARINGS.					
2. WIPE CLEAN EXTERIOR OF UNIT.					
3. APPLY GREASE ON MOTOR AND PUMP SHAFTS.					
4. CLEAN WATER STRAINERS.					
5. EXERCISE WATER VALVES.					
6. CHECK AND CLEAN MAGNETIC CONTACTOR.					
7. CLEAN DRIP PAN AND CLEAR DRAIN LINES.					
8. CHECK PACKING GLANDS OR MECHANICAL SEALS FOR LEAKS. ADJUST PACKING.					
9. INSPECT UNITS FOR EXCESSIVE NOISE, VIBRATION OR HEAT.					
10. CLEAN UP AREA AROUND UNIT; SWEEP AND PICKUP DEBRIS.					
11. CHECK AND RECORD EQUIPMENT FOR PROPER VOLTAGE AND AMPERAGE. VOLTAGE: _____ AMPERAGE: _____					
12. CLEAN, SPOT PRIME AND PAINT RUST SPOTS NOT TO EXCEED TIME ALLOTTED.					
13. CHECK INSULATIONS, VAPOR BARRIER AND RELATED COMPONENTS FOR DEFECTS.					
14. CHECK PRESSURE GAUGES FOR PROPER OPERATING CONDITIONS. RECORD READINGS: INLET _____ OUTLET _____					
15. CHECK ELECTRICAL WIRING/CONTROLS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.					
16. EXAMINE GUARDS, CASINGS, SUPPORTS, PLATFORMS, AND MOUNTING BOLTS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.					
:					
DEFICIENCY: _____					

REVIEWED BY: _____ DATE: _____					

PMI CHECKLIST CHILLER

SCHEDULED DATE:

DATE PERFORMED: _____

PERFORMED BY: _____ / _____

BLDG: _____ LOCATION: _____ EQUIP. NO. _____

WORK PERFORMED

N/A	YES	NO
-----	-----	----

1.	Inspect and record compressor oil sightglass for proper oil level.			
2.	Inspect units for excessive noise, vibration, or heat.			
3.	Clean up area around units; sweep and pickup debris.			
4.	Wipe clean exterior of unit.			
5.	Check and clean magnetic contactors.			
6.	Wipe clean exterior of motors and compressors.			
7.	Check and record equipment for proper voltage and amperage. Voltage _____ Amperage _____			
8.	Check electrical wiring/controls for defects. Tighten loose connections.			
9.	Inspect entire system for water, oil, refrigerant, or air leaks. Tighten loose connections.			
10.	Clean dampers, registers, louvers, grills, bird, and insect screens on equipment only.			
11.	Examine guards, casings, hangers, supports, platforms, and mounting bolts for defects. Tighten loose connections.			
12.	Check temperature and pressure gauges for proper operating conditions. Record readings.			
13.	Exercise water valves.			

Deficiency:

[illegible]

PMI CHECKLIST CHILLER

SCHEDULED DATE:

DATE PERFORMED: _____

PERFORMED BY: _____ / _____

BLDG: _____ LOCATION: _____ EQUIP. NO. _____

WORK PERFORMED

N/A	YES	NO
-----	-----	----

1.	Inspect and record compressor oil sightglass for proper oil level.			
2.	Inspect units for excessive noise, vibration, or heat.			
3.	Clean up area around units; sweep and pickup debris.			
4.	Wipe clean exterior of unit.			
5.	Check and clean magnetic contactors.			
6.	Wipe clean exterior of motors and compressors.			
7.	Check and record equipment for proper voltage and amperage. Voltage _____ Amperage _____			
8.	Check electrical wiring/controls for defects. Tighten loose connections.			
9.	Inspect entire system for water, oil, refrigerant, or air leaks. Tighten loose connections.			
10.	Clean dampers, registers, louvers, grills, bird, and insect screens on equipment only.			
11.	Examine guards, casings, hangers, supports, platforms, and mounting bolts for defects. Tighten loose connections.			
12.	Check temperature and pressure gauges for proper operating conditions. Record readings.			
13.	Exercise water valves.			

[illegible]

PMI CHECKLIST FAN COIL UNIT (CHILL WATER)

SCHEDULED DATE: _____

DATE PERFORMED: _____

PERFORMED BY: _____

BLDG: _____ LOCATION: _____ EQUIP. NO. _____

WORK PERFORMED

N/A	YES	NO
-----	-----	----

[illegible]

Deficiency:

[illegible]

J.O.# _____

PMI CHECKLIST

SCHEDULED DATE: _____

ACT. ~~_____~~

CHILL WATER PUMP

DATE PERFORMED: _____

FREQUENCY: QUARTERLY

PERFORMED BY: _____/_____

BLDG. _____ LOCATION: _____ EQUIP. NO. _____		WORK PERFORMED		
DESCRIPTION OF WORK		N/A	YES	NO
1. LUBRICATE MOTOR AND PUMP BEARINGS.				
2. WIPE CLEAN EXTERIOR OF UNIT.				
3. APPLY GREASE ON MOTOR AND PUMP SHAFTS.				
4. CLEAN WATER STRAINERS.				
5. EXERCISE WATER VALVES.				
6. CHECK AND CLEAN MAGNETIC CONTACTOR.				
7. CLEAN DRIP PAN AND CLEAR DRAIN LINES.				
8. CHECK PACKING GLANDS OR MECHANICAL SEALS FOR LEAKS. ADJUST PACKING.				
9. INSPECT UNITS FOR EXCESSIVE NOISE, VIBRATION OR HEAT.				
10. CLEAN UP AREA AROUND UNIT; SWEEP AND PICKUP DEBRIS.				
11. CHECK AND RECORD EQUIPMENT FOR PROPER VOLTAGE AND AMPERAGE. VOLTAGE: _____ AMPERAGE: _____				
12. CLEAN, SPOT PRIME AND PAINT RUST SPOTS NOT TO EXCEED TIME ALLOTTED.				
13. CHECK INSULATIONS, VAPOR BARRIER AND RELATED COMPONENTS FOR DEFECTS.				
14. CHECK PRESSURE GAUGES FOR PROPER OPERATING CONDITIONS. RECORD READINGS: INLET _____ OUTLET _____				
15. CHECK ELECTRICAL WIRING/CONTROLS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.				
16. EXAMINE GUARDS, CASINGS, SUPPORTS, PLATFORMS, AND MOUNTING BOLTS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.				
DEFICIENCY: _____				

REVIEWED BY: _____ DATE: _____				

J.O.# _____

PMI CHECKLIST

SCHEDULED DATE: _____

ACT. ~~_____~~

CHILL WATER PUMP

DATE PERFORMED: _____

FREQUENCY: QUARTERLY

PERFORMED BY: _____/_____

BLDG. _____ LOCATION: _____ EQUIP. NO. _____		WORK PERFORMED		
DESCRIPTION OF WORK		N/A	YES	NO
1. LUBRICATE MOTOR AND PUMP BEARINGS.				
2. WIPE CLEAN EXTERIOR OF UNIT.				
3. APPLY GREASE ON MOTOR AND PUMP SHAFTS.				
4. CLEAN WATER STRAINERS.				
5. EXERCISE WATER VALVES.				
6. CHECK AND CLEAN MAGNETIC CONTACTOR.				
7. CLEAN DRIP PAN AND CLEAR DRAIN LINES.				
8. CHECK PACKING GLANDS OR MECHANICAL SEALS FOR LEAKS. ADJUST PACKING.				
9. INSPECT UNITS FOR EXCESSIVE NOISE, VIBRATION OR HEAT.				
10. CLEAN UP AREA AROUND UNIT; SWEEP AND PICKUP DEBRIS.				
11. CHECK AND RECORD EQUIPMENT FOR PROPER VOLTAGE AND AMPERAGE. VOLTAGE: _____ AMPERAGE: _____				
12. CLEAN, SPOT PRIME AND PAINT RUST SPOTS NOT TO EXCEED TIME ALLOTTED.				
13. CHECK INSULATIONS, VAPOR BARRIER AND RELATED COMPONENTS FOR DEFECTS.				
14. CHECK PRESSURE GAUGES FOR PROPER OPERATING CONDITIONS. RECORD READINGS: INLET _____ OUTLET _____				
15. CHECK ELECTRICAL WIRING/CONTROLS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.				
16. EXAMINE GUARDS, CASINGS, SUPPORTS, PLATFORMS, AND MOUNTING BOLTS FOR DEFECTS. TIGHTEN LOOSE CONNECTIONS.				
DEFICIENCY: _____				

REVIEWED BY: _____ DATE: _____				

Important notes:

1. All original condensing unit motors and fan bearings:
"REQUIRE NO LUBRICATION"
2. Condenser coils: *"MUST BE KEPT CLEAN"*. Before attempting to clean coils ensure that electrical power is shut off. *"DO NOT BEND OR DAMAGE FINS"*
3. *"AIR HANDLER – FILTER INFORMATION"* - FILTERS SHOULD BE CHECKED EVERY 30 DAYS AND REPLACED OR CLEANED AS NECESSARY.
4. *AIR HANDLER – BLOWER INFORMATION*: Blower wheels must be clean in order to ensure optimum operation. To inspect and clean the blower wheel, ensure that all power is shut off to the unit. Clean the assembly, check the bearings for looseness, rotate blower wheel while listening close to each bearing and with a finger on the bearing to check for noise or roughness in the bearing which will indicate a failing bearing.
5. *OBSTRUCTION TO AIR FLOW*: Supply and return grills must be kept clear so air can be freely drawn into and discharged from the system.

Monthly:

- ⊗ Lubricate bearings if operating continuously at 1500 rpm, or higher, or in other extreme conditions.
- ⊗ Check cleanliness of filters, and replace is necessary.
- ⊗ Check cooling coil drain pan to assure proper drainage.
- ⊗ Inspect evaporator, and condensing coils. Clean if dirty, or obstructed in any way.

Quarterly:

- ⊗ Lubricate bearings if operating at 1000 rpm, or less, and in temperatures less than 150° F, or other extreme conditions.
- ⊗ Check damper operation for freedom of movement. Correct any binding that may occur. Check belts, and pulleys on all fan drives for tension, and unusual wear. (Note: Ensure that all belts are properly aligned. Refer to manufacturers specifications for correct alignment procedures.)
- ⊗ Check of cooling section.
- ⊗ Check inlet, and outlet air temperatures. Determine cause for abnormal changes.

Annually:

- ❖ Clean the condenser, and evaporator coils with steam, or a non-corrosive coil cleaner.
- ❖ Clean the drain line, "P" trap, and condensate pan.
- ❖ Check refrigerant pressures and temperatures and correct unusual operation.
- ❖ Check all electrical connections for tightness. Replace any suspect wires that show signs of deterioration. Ensure that all electrical wires and systems are operationally sound.

(a) Maintenance Personnel Operation: (Daily)

CUSTODIAL INSPECTION REPORT				
Custodian: _____		Date: _____		
Building: _____		Inspected by Supervisor: _____		
	Good	Marginal	Poor	Remarks
RESTROOM AREA				
▷ Empty Waste Basket				
▷ Sanitize toilet bowls/urinal				
▷ Refill paper towel/tissue/soap dispensers				
▷ Sweep Floors				
W Wipe Walls				
W Mop Floors				
CLASSROOM AREA				
▷ Empty Waste Basket				
▷ Clean Blackboard/Whiteboard				
▷ Sweep Floors				
▷ Wet Mop Floors				
W Wipe Walls				
▷ Spot Remove, Tile Floor				
Y Wax Floors				
M Clean Vents				
M Clean Light Fixtures				
M Clean/Wipe Window Frames				
Q Wash Windows				
OFFICE AREA				
▷ Sweep Floors				
▷ Empty Waste Basket				
Q Wash Windows				
▷ Spot Remove, Tile Floor				
▷ Wet Mop, Tile Floor				
W Vacuum Carpet				
Q Wax Bookcase, Chair, Cabinet, Furniture				

(b) Organization Operation: (Scheduled Service)

(c) Command Operation: (Deferred Maintenance)

3. Repair Parts

Requiring for tools are conducted through a procedure in place and Jerry Guerrero maintains the records of all those who have signed out tools / equipment. The supervisors are also responsible to ensure that their personnel are equipped with the proper tools to conduct their assigned task @ hand. Every year prior to the new FY budget the supervisors are ask to conduct an inventory of the tools / equipment for serviceability and submit a request to me for approval to replace due to fair wear and tear or a need for a certain tool / equipment.

4. Tools Operation

Requiring for tools are conducted through a procedure in place and Jerry Guerrero maintains the records of all those who have signed out tools / equipment. The supervisors are also responsible to ensure that their personnel are equipped with the proper tools to conduct their assigned task @ hand. Every year prior to the new FY budget the supervisors are ask to conduct an inventory of the tools / equipment for serviceability and submit a request to me for approval to replace due to fair wear and tear or a need for a certain tool / equipment.

For Personal Protective Equipment (PPE) it become the responsibility of the individual to ensure that they maintain at all time proper PPE for the require task at hand and must keep constant communication with their immediate supervisor and the Supply office.

5. Key Control

Requiring for tools are conducted through a procedure in place and Jerry Guerrero maintains the records of all those who have signed out tools / equipment. The supervisors are also responsible to ensure that their personnel are equipped with the proper tools to conduct their assigned task @ hand. Every year prior to the new FY budget the supervisors are ask to conduct an inventory of the tools / equipment for serviceability and submit a request to me for approval to replace due to fair wear and tear or a need for a certain tool / equipment.

6. Petroleum, Oil and Lubricate (POL)

Requiring for tools are conducted through a procedure in place and Jerry Guerrero maintains the records of all those who have signed out tools / equipment. The supervisors are also responsible to ensure that their personnel are equipped with the proper tools to conduct their assigned task @ hand. Every year prior to the new FY budget the supervisors are ask to conduct an inventory of the tools / equipment for serviceability and submit a request to me for approval to replace due to fair wear and tear or a need for a certain tool / equipment.

7. Awards Program

8. Cross Training, OJT, Apprenticeship Program

9. Fire Prevention

10. Reports

11. Calibration

12. Personnel Training

13. Natural Disasters Response Operation

PURPOSE and GUIDELINES: The purpose of these guidelines is to provide an organized procedure that deals with preparation for a typhoon. The Maintenance Division is, tasked with the responsibility of accomplishing this operation. The Division will be, divided into five (5) teams with team leader. Each team will be responsible for boarding up designated buildings. As each assigned building is, completed the team leader will radio or telephone base of the completion and the team leader will escort their team to the next available building requiring assistance or request for further instructions from base.

NOTIFICATION: Once the Building Maintenance Superintendent has been, notified of the weather conditions, a decision will be, announced to the division to prepare to secure the campus. If this announcement is during duty hours, the team leaders will assemble their crew as outlined in this Operational Instruction and begin securing the campus. In the event that they announcement it's condition three (3) is made after, working hours and the campus has not yet been secured, the recall procedures will begin immediately by the Building Maintenance Superintendent notifying the Team Leaders, and they will begin calling their team members. All those individuals without telephones will be responsible for monitoring the weather report after hours and calling their Supervisors for update. The Building Maintenance Superintendent may recall any employee anytime prior to the announcement of the Condition II depending on the status of the storm and prevailing conditions.

REQUIRED EQUIPMENT: Each Team leader will have a radio or telephone to communicate with base and will insure that the team has all the proper equipment needed to complete its assigned task and request for instructions from the Building Maintenance Superintendent.

DISPATCH: Once the Building Maintenance Superintendent has announced that the campus must be secure, each Team Leader is to recognize their personnel and dispatch them to their assigned building for immediate securing. All personnel must report to their Team Leaders for instructions. The Team Leader will be responsible for turning in the name and time of all personnel members present as well as submitting any required reports.

Should the announcement of Typhoon Condition II occurs after hours each Team Leader will begin contacting each team member to report to the campus immediately and the Team Leaders must report to the Building Maintenance Superintendent by radio/telephone as soon as possible.

Once the campuses are secure, all Team Leaders and personnel will report to the Maintenance Office/Shop. The Building Maintenance Superintendent or a designated representative will release all assigned maintenance personnel once all the teams have reported in and the campus security for cross-checked.

***** Strict adherence to these procedures is expected. There will be no early releases without authorization from the Building Maintenance Superintendent. If the Team Leaders are unable to contact the Building Maintenance Superintendent, they are to seek additional instruction from a designated representative.

Typhoon and Earthquake Condition *(Typhoon and Earthquake Restoration & Damaged Assessment)*

NOTIFICATION: Upon receiving notification, whether by Radio, Building Maintenance Superintendent, Team Leader all team members are to report immediately to the campus. Upon arrival, each team member will restore their assigned buildings and inspect for any damages that may have occurred. All Team Leaders will be responsible for submitting a preliminary report on the damages and a final report within three days after the incident.

The Damage Assessment Teams will be composed of the five (5) Team Leaders. Each Team Leader will submit damage estimates to the Building Maintenance Superintendent as soon as possible. Damage Assessment Teams will also include the University's Satellite locations in their assessments.

"Building Assignments"	"Teams"	"Team Leader & Personnel"	"Emergency Contact Numbers/."
Administration Building L.G. Building Fine Arts (All) Air Conditioner Units	Team – 1	Pedro Benito (Leader) Reynaldo Salas (Alternate 1) Carmencita Oquindo Thomas San Nicolas Joseph Quenga Fidel Francisco Bertha Meno (Alternate 2) Call Back	
CLASS / HSS Building Lecture Hall EC Building Marine Lab WERI Generator Houses	Team – 2	Joaquin Ninete (Leader) Michael Taijeron (Alternate 1) Franklin Blas Zina Pinault Archilles Ponce Anthony Q. Cruz Evelyn Siquig Gus Meno Leo De Guzman (Alternate 2) Call Back	

CNAS Building Science Health Science Warehouse “A” & “B” Dean Circle (ALL)	Team – 3	Jesse Lujan (Leader) Sibal Basilio (Alternate 2) Catalina Pineda Carmen Pinaula Juan Quichocho Rosemargaret Claros (Alternate 1) Call Back <i>(After securing Field House will report to Mr. Jesse Lujan)</i> Jude Cameno Virgilo Calceta Tony Guilas	
ELI Bldg. Computer Center/ MARC / PIP R.F.K. Library Trash Containers (ALL)	Team – 4	George Mendiola (Leader) Carmelino Medina (Alternate 1) Miranda Oderiong Crisanto Oquindo Cesar Pakingan Juan Quichocho Steve Perdido (Alternate 2) Call Back	
SOE (School of Education) Student Center Dorm – 1, 2 & 3 Maintenance Shop	Team – 5	William Payumo (Leader) Ricardo Ponce (Alternate 1) Adelaida Canlas Kenneth Mendiola Derek Blas Francisco Cruz (Alternate 2) Call Back	

Note: Fieldhouse has their maintenance workers who can handle securing the Fieldhouse. We will need them to report to the Building Maintenance Superintendent to assist in securing the rest of the campus.



Emergency Procedures: Shooting / Sniper / Campus Safety & Security

Emergency Telephone Numbers

1. Call **911 (9-911)**, then
2. Notify Campus Security at 735-2365 or 888-2456 then
3. Notify Safety Office at 735-2364/66 or 720- 4452, then
4. Notify Building Maintenance Superintendent at 735-2376 or 689-8769 (Cell)

Emergency Procedures: Shooting / Sniper / Violent Armed Individual

Types of Shooting Incident/Situation

- The type of shooting incident/situation will determine the appropriate response.
- **If you are outdoors**, immediately seek cover and move away from the line of fire.
- **If you are indoors**, immediately gets down, move away from all windows and if possible, block or secure the room door to prevent the suspect(s) from entering.
- **Do not evacuate rooms or the building until instructed to do so** by Campus Security, the Safety Office, or Building Maintenance Superintendent or a Guam Police Officer or unless it is absolutely clear that it is safe to do so.

- Special precautions must be taken to ensure that persons who have impaired hearing are notified and persons with disabilities are assisted as appropriate (see attachment A).
- Call **911 (9-911)** from a college telephone. **Do not hang up** on the dispatcher until instructed to do so. The following information should be provided:
 1. Indicate that there has been a shooting or that someone has been shot
 2. The exact location of the suspect(s) including the building number (if applicable), floor number (if applicable), room number (if applicable), nearest landmarks (bookstore, cafeteria, etc.)
 3. Whether you actually heard or saw any shots fired, if the suspect(s) is/are still shooting, what type of weapon(s) does the suspect(s) have? Handgun, Rifle, Shotgun or Explosive Device(s)?
 4. Description of suspect(s): race, clothing, direction of travel, vehicle(s)
 5. Condition and number of hostage(s) and victim(s) injured or killed
 6. Any information or demands supplied or made by suspect(s)?

Shooting Incident/Situation: Evacuate Only When Safe and Appropriate

→ **Active Shooter:**

Evacuation is Not Recommended as the suspect(s) is/are mobile and fluid and often seeks targets of opportunity

It is generally safer to seek cover if near the suspect(s) and then move away quickly and stealthily keeping cover between you and the suspect(s) in the opposite direction

→ **Sniper/Barricaded Suspect(s)**

Remain in place of shelter or safety until instructed to evacuate or leave

Follow instructions of police officer or building monitor

If shooting is in progress, keep a low profile and silhouette, always maintain cover, be silent, follow instructions

Violent Armed Individual

During incidents or situations where a subject is armed with a deadly weapon other than a firearm or suspected explosive device, such as a knife, ax, or club, and is threatening or attacking others, the following actions should be taken:

- The type of incident/situation will determine the appropriate response.
- If you are outdoors, immediately move away from the suspect(s) and seek assistance.
- If you are indoors, immediately move away from suspect(s) and if possible, block or secure the room door to prevent the suspect(s) from entering.
- Do not evacuate rooms or the building until instructed to do so by Campus Security, the Safety Office, or Building Maintenance Superintendent or a Guam Police Officer or unless it is absolutely clear that it is safe to do so.

- Special precautions must be taken to ensure that persons who have impaired hearing are notified and persons with disabilities are assisted as appropriate (see attachment A).
- Call 911 (9-911) from a college telephone. Do not hang up on the dispatcher until instructed to do so. The following information should be provided:
 1. Indicate that there has been an incident involving a weapon and someone has been or may be injured.
 2. The exact location of the suspect(s) including the building number (if applicable), floor number (if applicable), room number (if applicable), nearest landmarks (bookstore, cafeteria, etc.)
 3. Whether you actually heard or saw anyone threatening or injuring someone, if the suspect(s) is/are still threatening or injuring anyone, what type of weapon(s) does the suspect(s) have? Knife, Axe, Club or other type of weapon?
 4. Description of suspect(s): race, clothing, direction of travel, vehicle(s)
 5. Condition and number of hostage(s) and victim(s) injured or killed

Any information or demands supplied or made by suspect(s)
Attachment A

Assisting People with Disabilities during Emergencies

Always ASK someone with a disability how you can help BEFORE attempting to provide assistance. Ask how he or she can best be assisted and whether they are any special considerations or items that need to come with that person.

Blindness or Visual Impairment

Give verbal instructions to advise about the safest route or direction using compass directions, estimated distances, and directional terms (such as left, right, up, down).

DO NOT grasp a visually impaired person's arm - **ASK** if he or she would like to hold onto your arm as you exit, especially if there is debris or a crowd.

Give other verbal instructions or information as necessary.

Deafness or Hearing Loss

Get the attention of a person with a hearing disability by touch and eye contact. Clearly state the problem. Gestures and pointing are helpful, but **BE PREPARED TO WRITE** a brief statement if the person does not seem to understand.

Offer visual instructions to advise of the safest route or direction by pointing toward exits or evacuation maps.

Mobility Impaired

It may be necessary to help clear the exit route of debris (if possible) so that the mobility impaired person can move to a safer area.

If people with mobility impairments cannot exit, they should move to a safer area, e.g.,

Most enclosed stairwells.

An office with a door shut which is a good distance from the hazard (and away from falling debris in the case of earthquake).

If people are in immediate danger and cannot be moved to a safer area to wait for assistance, it may be necessary to evacuate them using a carry technique or, if available, an evacuation chair.

Notify police or fire personnel immediately about any people remaining in the building and their locations.

Police or fire personnel will decide whether people are safe where they are, and will evacuate them as necessary. The Fire Department may determine that it is safe to override the rule against using elevators.

Emergency Evacuation of People with Mobility Disabilities or Injured People

Evacuating a disabled or injured person yourself is the LAST resort. Consider your options and risks of injuring yourself and others in an evacuation attempt. DO NOT make an emergency situation worse.

Evacuation is difficult and uncomfortable for both the rescuers and people being assisted. Some people may have conditions that can be aggravated or triggered if they are moved incorrectly. Remember that environmental conditions (smoke, debris, loss of electricity) will complicate evacuation efforts. The following guidelines are general and may not apply in every circumstance:

Two or more **trained** volunteers, if available, should conduct the evacuation.

DO NOT evacuate disabled people in their wheelchairs - evacuate the person NOT the wheelchair. This is standard practice to ensure the safety of disabled people and volunteers. Wheelchairs will be evacuated later if possible.

Always **ASK** people with a disability how you can help **BEFORE** attempting any rescue technique or giving assistance. Ask how they can best be assisted or moved and if there are any special considerations or items that need to come with them.

Before attempting an evacuation, volunteers and the people being assisted should discuss how any lifting will be done and where they are going.

Proper lifting techniques (e.g., bending at the knees, keeping the back straight, holding the person close before lifting, and using leg muscles to lift) should be used to avoid injury to rescuers' backs

MEMORANDUM

January 2, 2007

TO: Deans, Directors and Campus Community
VIA: Chief Plant and Facilities Officer, Vice President for Administration and Finance, Senior Vice President for Academic & Student Affairs, Vice President for University & Community Engagement

FROM: Energy Savings Committee Chair & Energy Compliance Official
SUBJECT: **UOG's Energy Efficiency Planning**

PURPOSE

The following recommendations are a result of the Energy Savings Measures Committee's Assessment of Energy and Load Reduction Techniques (ALERT) at University of Guam, Mangilao, Guam performed in March 2005. Many, if not all, these recommendations are applicable at Interior facilities nationwide.

The strategies are grouped under the following elements.

1. Employee Awareness
2. Operation and Maintenance Policy and Procedures
3. Capital Improvements

Employee Awareness

Top-down leadership. The Vice president of Administration and Finance can create the expectation that energy efficiency and prudent use of electricity affects the university mission and would implement measures to reward energy savings and correct energy waste. An example might be to add effective control of personal energy use as a component of employee job descriptions and performance appraisals. Special notices such as Stage One, Stage Two and Stage Three utility system overload alerts, energy use reminders, and kudos for energy reduction would be most effective coming from the President's office.

It is strongly recommended that the administration seriously take into consideration the need to consolidate classes into two to three buildings during semester breaks (Maintenance Stand-down Time). This will allow maintenance to identify systems critically in need of replacement / renovation and at the same time address Energy-inefficient systems consuming utility dollars needlessly. Recommend to implement a campus curfew policy restricting access to buildings where lights are all turned off, window and split type air conditions are turn off at the end of each operation day.

"I have one recommendation to the Energy Savings Measures... it is to assign one Energy Efficient Officer for each division/college so he or she will report to the VP's/SVP's with respect to consuming of kWh (Kilowatt Hours). Each EEO will enforce the rules and policies set forth by the University Energy Officer (Frank Troy). Accounting will provide each division/college of their monthly utility bill which has the usage of kWh and they the EEO's could gauge the increase or decrease of utilities being used. I would recommend they monitor the usage and then within each quarter make a report to Troy. The EEO's will be the Energy police for each division/college. Base on the quarterly report Troy will in turn report the kWh usage of each college/division to the VP's. The VP's will send a memo to each Dean/Directors as to there status or utilities use of kWh. The memo will be a good comment if they are decreasing the kWh or a bad memo encouraging them to improve."

1. **Grass roots participation.** Every employee that uses energy (which is essentially every employee), must actively participate in order to realize maximum energy savings. As late as the 1970's littering was very common, but peers pressure was very effective in changing people's habits. There is no

substitute for co-workers to point out that it's "not cool" to leave the conference room light on when everyone leaves.

2. **Technical Guidance and Plans.** Most employees would require some guidance regarding how energy-consuming appliances, lighting, and local space conditioning equipment can be controlled. Recommendations for technical guidance are as follows:
 - A. **Training.** It is recommended that each employee receive training on
 - i. The importance of energy cost savings and existing policy directives. Staff should be informed of the cost of energy use, the environmental impact associated, and the cause and effects of energy supply interruptions.
 - ii. How to operate local energy consuming equipment (lights, HVAC, enable Energy Star computer features, shared resources such as printers and copiers). Provide mandatory and voluntary training opportunities on smart energy practices so that employees can practice energy efficiency during emergency periods and year-round. In addition to training, run public service announcements about energy efficiency on televisions in cafeterias and other public use areas; send periodic e-mail messages about turning off lights and computers and implementing other efficiency practices; post signs or billboards near light switches or communal printers; and consider holding annual energy fairs prior to seasonal emergency periods to provide additional information for employees about how to manage energy use in the work place and in their homes.
 - B. **Energy Action Plans.** Each employee would develop a one-page plan regarding systems under their control. The plan would list measures to be taken on a daily basis, as well as special measures that would be taken under Stage One, Stage Two and Stage 3 utility system overload alerts. Investigate separating loads into: life, health, and safety driven; mission critical; and non-critical.
3. **Feedback.** A measurement of the efficacy of the employee awareness program is required to secure and maintain cost savings, as well as to reward successful efforts and correct problem areas. Currently, very few facilities have real-time feedback regarding energy consumption levels. It is recommended that facilities look at establishing a system to provide real-time feedback. While this would be ideal if available on an individual-building basis, at this time it is recommended that the existing utility meters are enabled with communication and analysis hardware and software to display energy use data and trends.
4. **Accountability.** In response to a Stage One, Stage Two or Stage Three alert, facility managers will generally send a global message to all facility staff to curtail energy use. When everyone is made responsible, nobody feels uniquely responsible. It is recommended that an organizational structure be established to deliver information to staff and to report on progress, as needed. For example, each building contact would deliver information to identify life safety critical, mission critical, and non-essential loads for a plan of action and would assist all building occupants in implementing the plan-of-action under utility system alerts.

Operation and Maintenance Policy and Procedures

Many Facility operation and maintenance staff have changed procedures to achieve energy efficiency. Measures that should be considered include the following:

Replacing failed lamps with more energy-efficient alternatives and installing occupancy sensors with switch replacements or reconfigurations.

Installing T8 fluorescent lighting systems.

Replacing incandescent lamps with compact fluorescent lamps. If necessary, seek out vendors that manufacture compact fluorescent lamps that can maintain the appearance of a historic lamp.

Turning off hot water heaters when not in use.

Turning off Fume hoods when not in use.

Keep back up AC units off until needed.

Turning off unnecessary exterior lighting.

Turning off unnecessary interior lighting (security assistance) at the end of each day.

Create energy efficient work habits in the workplace.

Establish energy efficiency as one of the determining and selective factors when purchasing new office equipment such as copiers, which are heavy energy users.

Establish a curfew throughout the campus having lights out at 11pm to 6am.

Consolidate classes being held during the evening hours, Fridays, Saturdays and Sundays.

Anyone having to come into the campus building between the hours of 11pm to 6am is required to report to the campus security of your occupancy.

Other steps which could be immediately taken by staff include:

1. **Cooling Systems.** In buildings with air conditioning, raise indoor temperatures to 75 degrees; shutting down non-essential space cooling up to one hour before the normal close of each workday. Allow casual attire, to make higher temperatures more acceptable. Ensure that ventilation grilles and fan coil units are not blocked by books, flowers, debris, or other obstructions. Check HVAC systems filters and replace if pressure drop across surface exceeds, or is approaching, recommended maximum. This will improve air conditioning system efficiency and improve comfort. Reset air conditioning, and ventilation (HVAC) controls to minimize their operating hours and to repair or replace malfunctioning HVAC equipment such as economizers that bring in outside air to cool a building.

2. **Lighting.** Continue to replace incandescent lamps with high lumen compact fluorescent lamps in all common areas. Personal task lamps provided by staff or by the government should be compact fluorescent. Do not allow high wattage torchiere lamps. Turn off non-essential lighting. Lighting would be essential when it provides the IESNA recommended lighting level in areas where circulation is difficult, such as stairways or where pedestrians and vehicles might be in proximity. In areas with sufficient day lighting, turn off lights. Adjust blinds, if available, to reduce glare. Use task lighting and turn off general lighting, where it is feasible to maintain sufficient lighting levels for safety and productivity. Turn off display and decorative lighting. Turn off fluorescent lights when leaving an area for more than 1 minute. (During non-emergencies, 5 minutes is recommended, to keep from excessively reducing lamp life). Turn off incandescent lights when leaving areas for any period of time. Continue to install occupancy sensors to automate this lighting control.
3. **Weatherization.** Weather-stripping or measures to control air infiltration would reduce cooling energy consumption and improve comfort. Weatherization could reduce infiltration from 0.5 to 0.25 Air Changes per Hour.
4. **Water Fountains.** Turn off chilled water drinking fountains.
5. **Personal Computers.** Turn off printers when not in use. Turn off monitors when not in use. Ensure Energy Star(r) power down features is activated. If computers do not have Energy Star(r) features available, turn them off when leaving the office for more than 30 minutes.
6. **Personal Appliances.** Ensure personal appliances, such as coffee pots and radios are turned off when not in use. Encourage thermal insulated carafes rather than hot plates to keep coffee hot.
7. **Copiers** Encourage employees to not use copiers during peak demand period. Turn off selected copiers. Ensure power saver switch on copiers is enabled. Encourage staff to make copies in batches, so that the time a copiers is in high power mode is reduced

Capital Improvements

In general, capital improvement funds are very limited and the following recommendations would most likely rely on private sector financing.

1. **Energy Management and Control System.** Install energy management and control system for all facilities. While controls themselves do not automatically save energy, they provide information and the ability to control energy consuming systems which can result in very significant savings, depending on the strategy and diligence of the operator of the control system.
2. **Lighting Retrofit.** Replace all inefficient lighting systems with new T8 lamps and electronic ballasts. In many areas, this should be accompanied by an architectural redesign of the lighting systems. Replace incandescent lamps with compact fluorescents and replace exit signs with LED light sources. Install lighting controls (day lighting and occupancy) and bi- or tri-level switching of lighting circuits.
3. **Electric Utility System Upgrade.** The condition of the electrical distribution system is poor. Upgrade or replacement would reduce operating costs and improve efficiency of transformers.
4. **Mechanical System Upgrade.** Cooling equipment in the base case is assumed to have 70% efficiency. This could be upgraded to 85% by replacement or retrofit.
5. **Building Insulation.** Many of the older buildings are uninsulated or poorly insulated. This measure considered increasing walls to R10 and ceilings and floors to R5.

Thank You,

Frank Troy,
Energy Savings Committee Chair & Energy Compliance Official

Date

Approved:

David M. O'Brien,
Vice President for Administration and Finance

Date

Helen J.D. Whippy,
Senior Vice President for Academic & Student Affairs

Date

Jeff D.T. Barcinas,
Vice President for University & Community Engagement

Date

Harold L. Allen,
President for University of Guam

Date