DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

MCO P11000.9C
LFF-4
12 Nov 91

MARINE CORPS ORDER P11000.9C W/CH 1-4

From: Commandant of the Marine Corps
To: Distribution List

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI, ENERGY AND UTILITIES MANAGEMENT

Encl: (1) LOCATOR SHEET

Reports Required: List, page v

1. Purpose. To provide overall information and guidance on energy and utilities management.

2. Cancellation. MCO 4100.4A, MCO 4100.9C, MCO 4100.10B, MCO 4650.38, MCO 5060.17A, MCO 7310.14G, MCO P11000.9B, MCO 11300.9B, MCO 11300.10A, MCO 11300.11, MCO 11300.12, HQO 11310.1A, MCO 11310.4A, and MCO 11370.1C.

3. Summary of Revisions. This is a major revision and includes previously issued orders. It should be completely reviewed.

4. Applicability. This Manual applies to all Marines Corps activities and all Marine Corps-owned/ -used real property (classes 1 and 2) in the United States and overseas, unless otherwise noted.

5. Information.

a. Activity commanders are responsible for energy and utilities management at their shore activities.

b. A list of pertinent publications, glossary of definitions, and abbreviations/acronyms are included in this Manual in appendices A through C.

6. Recommendations. Recommendations concerning this Manual are invited and should be submitted to the CMC (LFF) via the appropriate chain of command.

7. Reserve Applicability. This Manual is applicable to the Marine Corps Reserve.

8. Certification. Reviewed and approved this date.

R. K. RIGGS
Acting Deputy Chief of Staff
for Installations and Logistics

DISTRIBUTION: PCN 10211300600

Copy to: 7000162 (25)
7000110 (5)
7000093, 144/8145004, 005, (2)
8145001 (1)

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

MCO P11000.9C Ch 1
LFF-1
23 Jul 92

MARINE CORPS ORDER P11000.9C Ch 1

From: Commandant of the Marine Corps
To: Distribution List

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI, ENERGY AND UTILITIES MANAGEMENT

Encl: (1) New page inserts to MCO P11000.9C

1. Purpose. To transmit new page inserts and direct pen changes to the basic Manual.

2. Action

a. Remove page iii and replace with corresponding page contained in the enclosure.

b. Remove pages 2-47 and 2-48 and replace with corresponding pages contained in the enclosure.

c. Remove appendix H and insert new appendix H contained in the enclosure.

d. On page A-2 make a pen change to add "DoDInst 4170.10, Energy Management Policy" between "DoD 4160.21M, Defense Disposal Manual" and "DoD 4270.1-M, Policy Guidelines for Installation, Planning, Design, Construction and Upkeep."

e. On page A-4 make a pen change to change the status of DEPPM 86-2, Defense Facilities Energy Security Program from, "In Effect" to "Canceled."

f. On page A-4 make a pen change to add new Defense Energy Program Policy Memorandum (DEPPM) "92-1 Department of Defense Energy Security Policy," after DEPPM 91-2.

3. Summary of Changes. This Change updates Marine Corps policy relative to energy security by incorporating recent Defense policy changes issued in DoDInst 4170.10 and as amplified in guidelines issued in DEPPM 92-1. Appendix H is published to provide installations updated guidelines for preparing Energy Systems Vulnerability Assessments, Energy Emergency Preparedness and Operation Plans, and Remedial Action Plans. Pen changes are made to update the list of pertinent DoD Reference Publications.

4. Change Notation. Paragraphs enoted by an arrow (>) symbol contain changes not previously published.

5. Filing Instructions. File this Change transmittal immediately behind the signature page of the basic Order.

R. K. RIGGS
Acting Deputy Chief of Staff
for Installations and Logistics

DISTRIBUTION: PCN 10211300601

Copy to: 7000162 (25)
7000110 (5)
7000093, 144/8145004, 005 (2)
8145001 (1)

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

MCO P11OOO.9C Ch 2
LFF- 1
28 Jan 98

MARINE CORPS ORDER P11000.9C Ch 2

From: Commandant of the Marine Corps
To: Distribution List

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI, ENERGY AND UTILITIES MANAGEMENT

Encl: (1) New page inserts to MCO P11000.9C

1. Purpose. To transmit new page inserts and direct pen and ink changes to the basic Manual.

2. Action

a. Remove pages iii thru v and replace with the corresponding pages contained in the enclosure.

b. Remove pages 2-1 thru 2-3 and replace with the corresponding pages contained in the enclosure.

c. Remove pages 2-7 thru 2-15 and replace with pages 2-7 thru 2-15 and 2-16 contained in the enclosure.

d. On page 2-5, paragraph 2101.1, make a pen change to change the existing "Figure 2-2" to "Figure 2-3".

e. On page 2-5, paragraph 2101.1, make a pen change to change the existing "Figure 2-2" to "Figure 2-3".

f. On page 2-19, paragraph 2201.2b, make a pen change to change the existing "Figure 2-3" to "Figure 2-4".

g. On page 2-19, paragraph 2202.2b, make a pen change to change "shared energy savings (SES) contracting" to "alternative funding".

h. On page 2-20, paragraph 2202.2d, make a pen change replacing the existing paragraph with "d. Alternative Funding. Alternative funding methods are discussed in chapter 3, section 5."

i. On page 2-22, paragraph 2202.6d, make a pen change to change the existing "Figure 2-4" to "Figure 2-5".

j. On page 2-30 make a pen change to change the existing "Figure 2-3" to "Figure 2-4".

k. On page 2-31 make a pen change to change the existing "Figure 2-4" to "Figure 2-5".

l. Remove pages 2-33 thru 2-34 and replace with pages 2-33 thru 2-34c contained in the enclosure.

m. Remove pages 2-37 thru 2-42 and replace with pages 2-37 thru 2-41 contained in the enclosure.

n. On page 2-44, paragraph 2301.1, make a pen change to change the existing "Figure 2-9" to "Figure 2-7".

o. On page 2-46 make a pen change to change the existing "Figure 2-9" to "Figure 2-7".

p. Remove pages 3-1 and 3-2 and replace with the corresponding pages in the enclosure.

q. Add pages 3-23 thru 3-25 contained in the enclosure.

r. Remove chapter 5, REPORTS, from the Manual.

s. Remove appendix F and replace with the corresponding appendix contained in the enclosure.

t. Remove appendix J, REPORTS REQUIRED AND SUMMARY OF OTHER SUBMISSIONS, from the Manual.

u. Add appendix M contained in the enclosure.

3. Summary of Changes. This Change updates Marine Corps policy relative to ECIP, EIP, the UCAR, Procurement, and Alternative Funding by incorporating recent Defense policy changes issued in:

the Unnumbered DEPPM, dated 17 Mar 93; Executive Order 12902; NAVCOMP MANUAL, Change #362; and DEPPM's 93-1, 92-1, and 91-3. Appendix M is published to provide installations updated guidelines for the procurement of direct supply natural gas.

4. Change Notation. Paragraphs denoted by an arrow (>) symbol contain changes not previously published.

5. Filing Instructions. File this Change transmittal immediately behind the signature page of the basic Manual.

J. D. STEWART
Deputy Chief of Staff
for Installations and Logistics

DISTRIBUTION: PCN 102 11300602

Copy to: 7000162 (25)
7000110 (5)
7000093, 144/8145004, 005 (2)
8145001 (1)

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

MCO P11000.9C Ch 3
LFF-1
29 Dec 98

MARINE CORPS ORDER P11000.9C Ch 3

From: Commandant of the Marine Corps
To: Distribution List

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI, ENERGY AND UTILITIES MANAGEMENT

Encl: (1) New page inserts to MCO P11000.9C

1. Purpose. To transmit new page inserts and direct pen and ink changes to the basic Manual.

2. Action

a. Remove pages iii and v and replace with the corresponding pages contained in the enclosure.

b. Remove pages 3-1 through 3-2 and replace with the corresponding pages contained in the enclosure.

c. Remove pages 3-9 through 3-15 and replace with pages 3-9 through 3-12 contained in the enclosure.

d. On page 2-22, paragraph 2202.5, on lines two and five delete "DEIS II" and make pen change to read "DUERS."

e. On page 2-22, paragraph 2202.6a, on line two, delete "DEIS II" and make pen change to read "DUERS."

f. On page 2-22, paragraph 2202.6b, on line one, delete "DEIS II" and make pen change to read "DUERS."

g. On page 3-3, delete present chapter title and make pen change to read "PROGRAMS."

h. On page 3-6, paragraph 3102.15, delete "DEIS II" and make pen change to read "DUERS."

i. On page 3-17, delete present chapter title and make pen change to read "PROGRAMS."

j. On page 3-19, delete present chapter title and make pen change to read "PROGRAMS."

k. On page 3-23, delete present chapter title and make pen change to read "PROGRAMS."

l. Appendix C, page C-1 delete acronym and long title "DEIS II, Defense Energy Information System" and make pen change to read "DUERS, Defense Utility Energy Reporting System."

m. Appendix K, on page K-1, make a pen change to title, delete "DEIS II" and make pen change to read "DUERS."

n. Appendix K, on page K-2, second column heading, delete "DEIS II" and make a pen change to read "DUERS."

o. Appendix K, on page K-2, second column heading, delete "DEIS II" and make pen change to read "DUERS."

p. Remove appendix L and replace with the appendix L contained in the enclosure.

q. Add new appendix N contained in the enclosure.

3. Summary of Changes. This Change updates Marine Corps policy and information relative to awards and the Defense Utility Energy Reporting System (DUERS). Appendix N is published to provide installations updated guidelines for the SECNAV Energy Conservation Awards.

4. Change Notation. paragraphs denoted by an arrow (>) symbol contain changes not previously published.

5. File Instructions. File this Change transmittal immediately behind the signature page of Change 2 of basic Manual.

G. B. HIGGINBOTHAM
Deputy Chief of Staff
for Installations and Logistics

DISTRIBUTION: PCN 10211300603

Copy to: 7000110 (55)
7000162 (25)
7000093, 144/8145004, 005 (2)
8145001 (1)

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
2 NAVY ANNEX
WASHINGTON, DC 20380-1775

MCO P11000.9C Ch 4
LFF-1
27 Feb 06

MARINE CORPS ORDER P11000.9C Ch 4

From: Commandant of the Marine Corps
To: Distribution List

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI, ENERGY AND UTILITIES MANAGEMENT

Encl: (1) New page inserts to MCO P11000.9C

1. Purpose. To transmit new page inserts and direct pen and ink changes to the basic Manual.

2. Action.

a. Remove page 2-1 and replace with corresponding page contained in the enclosure.

b. Remove page 2-14 and replace with corresponding pages contained in this enclosure.

c. On page 1-3, paragraph 1002.4, make pen changes to add the words "and water" following each reference to "energy."

d. On page 1-3, paragraph 1002.5, make pen change to add the words "and water" following the reference to "energy."

e. On page 1-4, paragraph 1003.2, make pen changes to add the words "and water" following the reference to "energy."

3. Summary of Changes. This change updates Marine Corps policy relative to water management by incorporating new Department of Defense Installation Management policy issued in DoDI 4170.11, Installation Energy Management, dated 22 November 2005.

4. Change Notation. Paragraphs denoted by an arrow (>) symbol contain changes not previously published.

5. Filing Instructions. File this change transmittal immediately behind the signature page of the basic Manual.

R. S. KRAMLICH
Deputy Commandant
For Installations and Logistics

DISTRIBUTION: PCN 10211300604

Copy to: 7000162(25)
7000093,144/8145004,005 (2)
7000260/8145001 (1)

LOCATOR SHEET

Subj: REAL PROPERTY FACILITIES MANUAL, VOLUME VI,
ENERGY AND UTILITIES MANAGEMENT

Location: _____
(Indicate the location(s) of the copy(ies) of this Manual.

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

RECORD OF CHANGES

Log completed change action as indicated.

Change Number	Date of Change	Date Entered	Signature of Person Incorporated Change

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

CONTENTS

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

REPORTS REQUIRED

REPORT TITLE	REPORT CONTROL SYMBOL	PARAGRAPH
>I. Energy Management Annual Report	(DD-4100-03)	2103.2.a(8) 2103.2.b(6) app. F
>II. DUERS, Utility Energy Report	DD-4100-02 External DD-P&L	2202.5, app. K & L (AR) 1131
III. Utilities Cost Analysis Report (NavCompt 2127)	MC-7310-24	2406.l.a 2406.2
IV. Potential/Actual Utility Consumption and Rate Increase/Decrease	EXEMPT	2502, 2503, and fig. 2-6

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1000. PURPOSE. This volume of the Real Property Facilities Manual provides the objectives, policies, criteria, and procedures to manage Marine Corps utilities and energy systems. It is the primary information source on utilities management and energy conservation for the facilities maintenance and public works officers and the utilities engineer. Other information is available in the publications listed in appendix A. This includes the current effective Defense Energy Policy Memoranda.

1001. DEFINITIONS AND ABBREVIATIONS. Appendix B is a list of definitions. Appendix C is a list of abbreviations/acronyms used with utilities and energy management.

1002. OBJECTIVES. The objectives of utilities and energy management are:

1. To furnish utility services required to accomplish the assigned missions with the lowest possible life-cycle cost and least amount of waste.

2. To maintain and repair, in the most economical manner, all active utilities to a standard which will permit continued use for their designated purposes.

3. To orderly and economically modify or expand utilities systems as required by changes in missions, base loadings, etc.

>Ch 4 4. To meet or exceed Federal energy and water conservation goals through management action, investment in energy and water conservation technology and equipment, and through information and recognition programs to create energy and water conservation awareness throughout the Marine Corps.

>Ch 4 5. To implement energy and water conservation programs to reduce energy and water use in a way that does not impair the training, readiness, and combat capability of strategic and tactical forces or the health and safety of military and civilian personnel and the environment.

1003. POLICIES. To accomplish the preceding objectives, the following policies are established:

1. Management. Programs directed toward improved management and supervision will be continued and/or initiated. Particular emphasis will be placed on the effective use of budget, cost, operating, and property information at all levels.

>Ch 4 2. Energy and Water Conservation. Positive programs conserving utilities shall be continued to ensure that use does not exceed actual requirements. All design, maintenance, and repair efforts shall include specific considerations of energy and water conservation methods and systems.

3. Standards and Criteria. Utilities operations and maintenance standards and criteria shall be continuously monitored, improved, and promulgated to ensure uniform cost-effective procedures.

4. Facility Utilization. Activity functions shall be concentrated in the minimum number of facilities, consistent with mission requirements, to economize on maintenance and conserve utilities.

5. Standby and Emergency Facilities. Emergency and/or standby facilities will be installed and maintained only as necessary to meet emergency operations.

6. Commercial Services. Maximum use shall be made of utilities available from commercial services when economically justified (in lieu of construction or expansion of government facilities).

7. Cross-Servicing. Maximum use will be made of cross-servicing of utilities among Marine Corps activities and other government agencies to make the most efficient use of available utilities.

8. Aesthetics. Consideration of improved aesthetics shall be incorporated in the plans, designs, construction, and maintenance of utilities plants and systems to contribute to environmental enhancement and activity beautification.

9. Joint Utilities Service Boards. Maximum use and coordination will be made with the regional Joint Utilities Services Boards (JUSB) in matters relating to commercial utilities and DoD directed real property maintenance activity (RPMA) consolidation studies.

10. Personnel and Training. Activities shall develop and maintain an effective program to select, place, train, transfer, promote, and use utilities personnel.

11. Records Disposition. Records, including reports and supporting documentation created by this Manual will be disposed of as directed by SECNAVINST 5215.5.

1004. SCOPE AND APPLICABILITY

1. Scope. Marine Corps utilities usually include the following:

a. Heat sources (including distribution lines) over 750,000 British thermal units per hour (Btu/h) capacity.

b. Electric power generation and distribution systems.

c. Potable water supply and distribution systems.

d. Nonpotable water supply and distribution systems.

e. Sewage collection and treatment systems.

f. Air-conditioning systems (5 tons and greater).

g. Gas-generating plants and distribution lines.

h. Pneumatic power systems.

i. Fuels issued to heating plants under 750,000 Btu/h capacity.

j. Other utilities such as propane fuel, ice-manufacturing plants, cold storage plants, central dehumidification systems, central hydraulic systems, and acetylene and oxygen generating systems.

2. Applicability. Commanders of all Marine Corps activities listed in appendix D shall fully comply with this Manual.

> CHAPTER 2

ORGANIZATION

CHAPTER 2

ORGANIZATION

SECTION 1: UTILITIES AND ENERGY MANAGEMENT

2100. GENERAL INFORMATION. Utility systems produce and distribute services essential to the operation of Marine Corps activities. Energy sources (fuels, sun, wind, water, etc.) have the capacity to produce the power, heat, and electricity used/consumed in utilities system operations. Energy and utility use directly affect productivity, quality of life, and working conditions of facility occupants, and the quality of the environment at Marine Corps activities. Prudent energy and utilities management practices are critical to assuring adequate energy is available at a minimum cost and with the least environmental impact.

2101. OBJECTIVE AND RESPONSIBILITY. One objective of the Marine Corps is to optimize the use of materials, equipment, and manpower needed to operate and maintain utilities systems. The utilities branch is responsible for efficient operation and operator maintenance of utilities systems as directed by MCO P11000.7. Further, the operations branch of the facilities maintenance division coordinates the scheduling of maintenance and overhaul work performed by the maintenance and repair branch on utilities systems.

1. Facilities Maintenance Division. Organizationally, the facilities management functions may be structured as shown in the diagram provided as figure 2-1, although different structures may be found at different installations. The facilities maintenance division consists of four branches, as depicted in figure 2-3.

2. Utilities Branch. The utilities branch is responsible for the efficient operation and operator's maintenance of the activity's utilities systems. This responsibility includes the operation of nonautomated plants, periodic inspection of automated plants and distribution systems, maintaining and evaluating operational records, evaluating performance reports, coordinating the scheduling of maintenance and overhaul work, ensuring sufficient supplies of fuels and materials, managing the utilities conservation programs, establishing and maintaining utilities targets, furnishing quantity data for budgeting and accounting, and planning for future utilities support requirements. The utilities branch shall maintain an active inspection and maintenance program as outlined in paragraphs 3100, 4200 through 4700, and appendix E, of this Manual.

3. Utilities Director. Sometimes referred to as the utilities engineer, this individual heads the utilities branch and is responsible to the facilities maintenance officer to provide

continuous technical assistance in the operation, maintenance, and conservation of utilities. This individual also serves as advisor and technical expert on utilities matters. The major goals of the utilities director are to increase production efficiency, reduce distribution losses, eliminate waste, and attain the procurement of utilities at a minimum cost.

2102. UTILITIES CONSERVATION AND APPRAISAL BOARD (UCAB)

1. Purpose. A group at the activity level to act in an advisory capacity, with direct access to the CG. Responsible to plan and pursue a progressive utilities conservation program.

2. Objective. Create an energy management plan and publish and instruction which identifies all actions needed to achieve the energy reduction goals that fit the requirements, constraints, opportunities, and organization of the activity. These goals maximize energy resource management effectiveness by concentrating on those areas that have the highest potential for success, such as:

a. Increased efficiency through resource substitution.

b. Reduced energy use through plant modernization and operations and maintenance (O&M) innovations.

c. More accurate reporting through improved measurement methods.

Continued progress will save valuable O&M funds, increase energy security, and improve mission capabilities. In determining utilities charges, meters shall be used when practicable and when the expense is warranted.

3. Membership. UCAB membership shall consist of representatives from the following:

a. Installation and logistics directorate.

b. Maintenance division.

c. Public works division.

d. Family housing office.

e. Comptroller’s office.

f. Tenant commands.

g. All levels of the command, down to battalion/squadron or comparable level.

h. Others as appointed by the activity commander. The utilities engineer, focal point for utilities management, shall act as advisor to the UCAB. Membership is on an additional duty basis.

4. Meetings. The UCAB shall meet quarterly. Minutes of the meetings will be recorded and retained for at least 2 years.

5. Duties. Duties of the UCAB should include, but are not limited to:

a. Publicize energy goals and progress toward those goals. Use bill boards, activity newspapers, plans of the day, etc.

b. Audit energy use. Determine how, where, and by whom energy is used.

c. Assign responsibility for energy resource management to an officer or equivalent civilian.

d. Conduct reviews of unmetered utilities services to verify or adjust consumtion estimates. Where meters to measure utility charges are not feasible, the UCAB shall establish equitable monthly quantity consumtions and every 3 years shall review the estimated quantities of unmetered services. Anticipated increases or decreases because of space occuied or equipment installed, generally warrant a special review.

e. Establish and maintain an active energy awareness program (see paragraph 2105 for details).

f. Apply priority emphasis to utilities systems maintenance to conserve energy.

g. Closely monitor the Long-Range Utilities and Energy Plan with particular emphasis on projected future energy requirements.

h. Review and evaluate existing utility contracts.

>2103. ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

1. Background. The ECIP is a military construction funded program to improve the energy efficiency of existing Department of Defense (DoD) facilities, in accordance with the unnumbered DEPPM, dated 17 March 1993. The projects funded through ECIP

will reduce government costs, improve the living and working environment of Defense personnel, enhance mission capabilities, and greatly decrease the negative environmental effects of Defense energy systems. The intent of ECIP is to minimize energy loss, use the latest energy saving techniques, materials, and equipment, and to install automatic energy monitoring and control systems to ensure energy efficient operations.

a. Definition. The ECIP is a subset of the Defense Agencies Military Construction (MILCON) program specifically designated for projects that save energy or reduce Defense energy costs. It includes the construction of new, high-efficiency energy systems or the improvement and modernization of existing systems.

b. Types of Projects. Energy conservation measures which fall within the economic criteria in paragraph 2103.4a below, can be submitted as proposed ECIP projects.

2. Responsibilities

a. Installation Responsibilities

(1) Develop and Submit Project Documentation to CMC. For each proposed ECIP project, the installation commander must conduct and submit a life cycle cost (LCC) analysis. The installation commander will submit a DD Form 1391 for each project and a DD Form 1390 for all energy projects in each FY. Specific guidelines for documentation are in appendix F.

(2) Design Projects. Installation commanders are responsible for funding the design of all approved ECIP projects. Funds transferred from CMC (LFF) for ECIP design will only be used for the design of approved ECIP projects.

(3) Revalidate Projects. Installation commanders will revalidate all ECIP projects with a new LCC analysis prior to advertisement to ensure that the project meets ECIP economic criteria. If the project fails to meet the economic criteria the scope must be adjusted and CMC (LFF) advised.

(4) Solicit Bids. The CMC will notify the installation commanders of authority to advertise. The installation commander will solicit bids and notify the CMC of the best bid received. Submit a revised LCC based on the best bid, and request authority to award the contract.

(5) Award Contract. Upon receipt of award authority, the installation commander will award the contract and monitor the construction. The installation commanders will notify the CMC in message text format when funds have been obligated for a specific funding document.

(6) Maintain Project Documentation and Validate Savings. Each installation shall maintain current auditable documentation on the execution status and the projected and realized savings for each approved ECIP project for the first 5 years of operation.

(7) Update Project List at HQMC. The installation commander must notify the CMC (LFF) as project requirements change, for example scope, cost growth, or cancellation of requirement.

(8) No later than 31 October each installation will submit the Energy Management Annual Report (RCS DD-4100-03) which details the status of approved ECIP projects. See appendix F, figure F-4.

b. HOMC ResDonsibilities

(1) Prioritize USMC Project List. Projects will be prioritized and programmed for a specific fiscal year funding based on the highest cost savings-to-investment ratio and shortest simple payback period.

(2) The CMC (LFF) will determine which projects will be approved for design and transfer funds for the design of those projects upon receipt of proposed project lists from the installations.

(3) Submit USMC Project List to DoD. Programmed projects with their supporting documentation (DD Form 1390, DD Form 1391, and LCC analysis), will be submitted to the OSD.

(4) The CMC (LFF) will provide award authority and coordinate the transfer of funds to the installation for construction of approved projects.

(5) HQMC will coordinate approval of all out of cycle projects.

(6) Submit consolidated Energy Management Annual Report (RCS DD-4100-03) for all Marine Corps installations to DoD by 30 November.

3. Programming Timeline. See figure 2-3 for programming milestones and submittal dates.

4. Programming Criteria. Proposed ECIP projects will be evaluated IAW the following criteria:

a. Economic Criteria

(1) The construction cost must be in excess of $500,000.

(2) Savings to Investment Ratio (SIR). For a project to be considered valid the SIR must be greater than 1.25. Procedures for calculation of Life Cycle Costs are found in appendix F.

(3) Simple Payback period. Projects must payback in 10 years or less.

b. Alternative Energy Sources. Those projects replacing use of nonrenewable energy sources with renewable energy sources will be given priority over other projects when their economic parameters are nearly equal.

c. Other proiects completed. The installation shall complete all cost-effective, low cost/no cost conservation actions which would reduce ECIP project scope and which can be completed before project development. All nonessential features unrelated to energy conservation shall be excluded from each project.

d. Energy Management and Control Systems (EMCS). The DD Form 1391c for EMCS projects will contain the following statement of commitment: "An appropriate staff of trained operators will be assigned within 90 days of award of the construction contract and sufficient assets to maintain the system will be committed throughout its useful life." For local control systems which do not require operators, the DD Form 1391c shall state, "This is a local control system which does not require an operator."

>2104. ENERGY INITIATIVES PROGRAM (EIP)

1. Background. The EIP is managed by the CMC (LFF) and provides O&M funds up to $500,000 to construct, repair, and replace utilities systems and facilities.

2. Submission. Listings of activity EIP project requirements will be requested annually for funding consideration with the rest of the Centrally Managed M2/R2 projects. In accordance with MCO P11000.5, project submissions must include:

a. DD Form 1391 with cost estimate.

b. National Environmental Policy Act (NEPA) documentation.

c. Life-cycle cost analysis summary.

2105. JOINT UTILITIES SERVICE BOARD (JUSB)

1. Objective. The objective of the JUSB is to provide a continuing means by which the defense components can exchange utilities procurement information; study problems, contract terms, and procedures; compare rate schedules; and, where possible, act jointly to obtain rates and terms most favorable to the Government.

2. Organization. JUSB and Joint Utilities Service Sub-boards (JUSSB) have been established for geographical areas noted as follows:

JUSB	JUSSB and Chairpersons
CONUS	Western, Navy Central, Air Force Eastern, Army
European	Not applicable to Marine Corps
Pacific	WestPac, Navy Hawaii, Air Force Japan/Korea, Army

Since the Naval Facilities Engineering Command (NAVFACENGCOM) is responsible for most utilities contracts for Marine Corps activities, the Navy representative also serves as the Marine Corps representative. For information on membership and meetings, contact the cognizant NAVFACENGCOM EFD utilities division.

3. Participation

a. Marine Corps activities are encouraged to participate in meetings of the JUSB and JUSSB and shall cooperate with and furnish assistance.

b. Marine Corps activities shall inform the JUSSB representative as soon as possible whenever a supplier proposes a utility rate increase.

2106. ENERGY AWARENESS

1. Background. While restrictions may be placed on energy use and sophisticated devices employed to govern potentially wasteful situations, indoctrination and training in conservation practices of all energy users are necessary. Through an aggressive program of group education and awareness publicity, a large reduction in energy use can be achieved. Secretaries of the military departments have been tasked to develop internal energy awareness programs to:

a. Publicize energy goals.

b. Disseminate information on energy matters and energy conservation techniques.

c. Emphasize energy conservation at all levels and relate energy conservation to operational readiness.

d. Promote energy conservation awards and recognition. To emphasize education and awareness, the Secretary of the Navy has established an annual Navy Department Energy Awareness Week. This event is held each October. Annually a Marine Corps bulletin in the 5060 series will advise activities of the "Awareness Week."

2. Information. Energy awareness literature is available from many sources. "Shore Facilities Energy Officers Guide," Department of the Navy, Document OPNAV 41P6A, September 1981, lists several of these sources. This document may be obtained through the CMC (AR), Stock No. 0584-LP-200-1423.

3. Action. A formal energy awareness program should be established to include the following:

a. Focus of the "whys" and "hows" of responsible energy management during energy training programs.

b. Promote energy awareness through awards and recognition programs.

c. Extend awareness activities to dependents, civilian employees, and local communities.

d. Distribute energy information (pamphlets, posters, films, bumper stickers, etc.).

MCO P11000.9C Ch 4
27 Feb 06
2107. WATER MANAGEMENT

1. Requirement. For the purpose of reducing potable water usage, Marine Corps installations are instructed to implement a life cycle cost effective water efficiency program which incorporates the following:

a. Comprehensive Water Management Plan.

b. Not less than four of the Department of Energy's (DOE) Federal Energy Management Program (FEMP) Water Efficiency Improvement Best Management Practices (BMP) with focus on dissemination of information to all levels to educate personnel on water conservation practices.

c. Reporting of potable water consumption and associated costs through the Department of the Navy's Defense Utility Energy Reporting System (DUERS).

2. Background

a. Per executive Order 13123, DOE was tasked to develop a water efficiency goal. Based on the efforts of an interagency working group comprised of representatives from each Federal agency and military service, DOE issued Guidance to Establish Water Efficiency Improvement Goal for Federal Agencies on 31 July 2000 (Document can be obtained from the FEMP website (www.eere.energy.gov/femp/technologies/water goals.cfm)).

b. The goal established by this guidance does not require Federal agencies to reduce water consumption by a set percentage, but instead focuses on the implementation of a Water Management Plan and selected BMPs.

c. Department of Defense (DoD) Instruction 4170.11 and Under Secretary of Defense (Acquisition, Technology, and Logistics), Installation Energy Policy Goals memorandum (dated 2 November 2004) fully incorporate the FEMP guidance into DoD installation management policy.

d. Funding resources identified in paragraph 2103 (Energy Conservation Investment Program), paragraph 2104 (Energy Initiatives Program), and Chapter 3, Section 5 (Alternative Funding for Energy Projects) of this Manual should be utilized for the purpose of executing water efficiency projects.

e. Additional guidance pertaining to water management can be obtained from the following sources:

(1) FEMP Water Efficiency web page (www.eere.energy.gov/femp/ technologies/water efficiency.cfm).

(2) DoD Energy Manager's Handbook, Chapter 13, Water Conservation (available on DoD Energy web page (http://www.acq.osd.mil/ie/irm/Energy/Energy.htm)).

(3) Department of the Navy Energy web page (https://energy.navy.mil/).

3. Water Management Plan. At a minimum, Water Management Plans will include the recommendations contained in Guidance to Establish Water Efficiency Improvement Goal for Federal Agencies, Attachment 1 - Facility Water Management Planning Guidelines.

4. FEMP Water Efficiency Improvement Best Management Practices

a. Instruction for implementing the following FEMP BMPs is provided in Guidance to Establish Water Efficiency Improvement Goal for Federal Agencies, Attachment 2 - FEMP Water Efficiency Improvement Best Management Practices:

BMP #1-Public Information and Education Programs
BMP #2-Distribution System Audits, Leak Detection, and Repair
BMP #3-Water Efficient Landscaping
BMP #4-Toilets and Urinals
BMP #5-Faucets and Showerheads
BMP #6-Boiler/Steam Systems
BMP #7-Single-Pass Cooling Systems
BMP #8-Cooling Tower Management
BMP #9-Miscellaneous High Water-Using Processes
BMP #10-Water Reuse and Recycling

b. Guidance for each BMP consists of:

(1) Operations and maintenance options - optimizing existing equipment and fixtures to minimize water use.

(2) Retrofit and replacement options - modifying or replacing outdated fixtures and equipment.

5. Program Implementation. BMPs can be considered implemented when the following criteria are met:

a. Water management plans have been developed/revised and incorporated into existing facility planning processes and operating plans.

b. Applicable operations and maintenance options have been put into practice.

c. Retrofit/replacement options have been reviewed within the last 2 years and cost-effective projects have been executed.

6. DUERS Reporting. Instruction for reporting through DUERS is contained in appendix L.

a. Consumption

(1) All potable water consumption will be reported. The "utility type" for potable water is PWT and is reported in thousands of gallons (KGAL).

(2) Non-potable usage such as reclaimed or recycled water should not be reported. For example, reclaimed water used to water a golf course would not be included under reportable water consumption. Other examples of non-potable water usage include seawater or untreated well water.

b. Cost

(1) Costs for water will only include the commodity purchase cost.

(2) No operations, maintenance, or treatment costs are to be included, which means that if an installation produces 100 percent of its own water, the reportable cost may be zero.

(3) The cost, if any, for consumption usage permits should be included in the cost of water.

(4) For installations that purchase 100 percent of water, the cost is equal to the commercial bill.

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

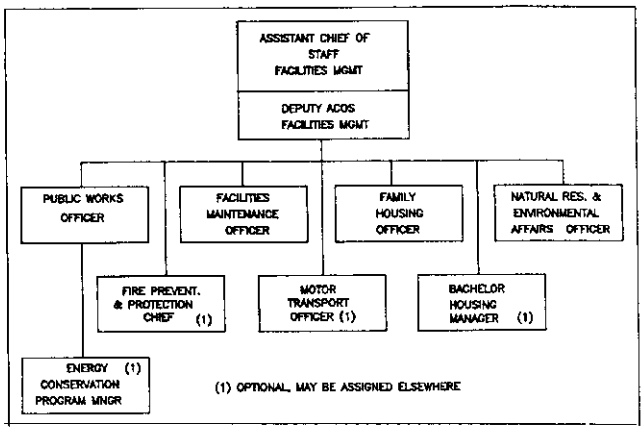


Figure 2-1.--Sample Structure of the Facilities Maintenance Office.

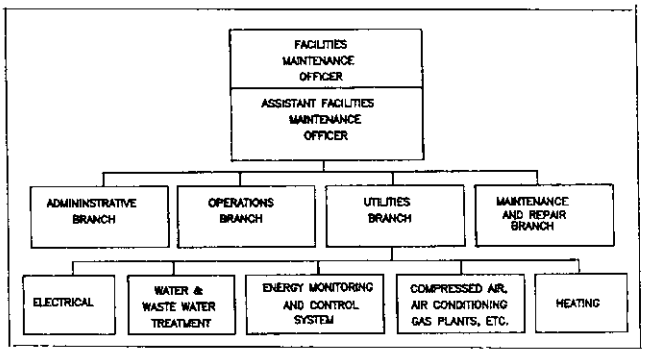


Figure 2-2.--Utilities Branch Facilities Division.

Figure 2-1. -- Sample Structure of the Facilities Maintenance Office

Figure 2-2. -- Utilities Branch Facilities Division

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

Event	Action Office	FY X-3	FY X-2	FY X-1	FY X	FY X+1
Identify Projects	Installation	√				
Submit to CMC	Installation	30-Sep				
Approve Design Start/Transfer Funds	CMC (LFF)		Nov			
Design Projects	Installation		35%, June	100%, Sep		
Submit 35% DD Form 1391s, DD Form 1390 and LCC to CMC	Installation		30-Jun			
Nominate Program to DoD	CMC (LFF)		15-Jul			
Advertise Projects Authorized By Congress	Installation				Oct	
Transfer Construction Funds to Installation (upon Approved Bids)	CMC (LFF)				√	
Document Project's Energy/Cost Saving Results	Installation					√
Submit Annual Report to CMC	Installation					31-Oct
Submit Annual Report to DoD	CMC (LFF)					1-Dec

Note: FY X is the fiscal year in which construction is anticipated to begin.

Figure 2-3.--ECIP Project Milestones.

> Figure 2-3.--ECIP Project Milestones.

2-16
Ch 2

CHAPTER 2

ORGANIZATION

SECTION 2: PLANNING

2200. OBJECTIVE. To realize the stability and economics inherent in systematic, orderly planning, activities shall develop a longrange plan for utilities and energy management. To this end, the following general objectives are established:

1. Achieve maximum practical energy conservation for facilities, operations, and training, with emphasis on conservation of petroleum and natural gas.

2. Substitute, when economically practical, alternative, more abundant, or renewable energy sources where petroleum and natural gas are now used.

3. Consider the effect of energy policy and actions on the health, welfare, security, and safety of personnel and the environment.

4. Consider the impact on manning levels of Marines and civilian employees.

2201. COMPREHENSIVE UTILITIES AND ENERGY PLANNING

1. The Utilities Master Plan. The importance of utilities on the attainment of mission goals and the delivery of services is frequently overlooked and understated. A comprehensive plan for utilities and the most efficient use and operations of utilities systems is necessary at each activity. The activity master plan is the first step in this process. The utilities master plan is a part of the overall activity master plan. Regional or municipal utility services normally include: water supplies, treatment facilities, and distribution systems; waste water collection systems and treatment facilities; and solid waste removal and disposal systems/sites. Public utilities provide services such as electric power and natural gas. In addition, many Marine Corps activities generate their own utilities (i.e., steam, electrical, water) and operate disposal systems (i.e., wastewater, solid waste, etc.). Existing capacity data and system layout plans are available within public works engineering divisions or from local utilities for use as a baseline. While future plans and projected needs are less explicit they become more finite as individual facilities are planned. Thus, the connections of Marine Corps utilities systems

to local public systems underscore the need for close coordination between the Marine Corps and local public planners and engineers.

a. Long-range utilities goals, objectives, and policies by local governments and authorities must be evaluated regarding their impact on Marine Corps missions in areas served by those utilities. The Marine Corps should play an active role in policy and goal formulation to assure that Marine Corps utility requirements are provided for over the short- and long-term.

b. Activity level energy efficiency planning should include: Solar orientation of buildings to maximize energy efficiency, compact building clusters to reduce the number and length of automobile trips, pedestrian/bicycle systems and transit service on-site and to off-site services, perimeter parking lots with pedestrian/bus links to on-site locations, protection of an individual building's solar access, maximum use of east-west streets to allow for efficient building solar orientation, the increased use of active and passive solar energy systems, and the use of energy conscious landscape planting/preservation techniques. Compact land use clusters and mixed use development cores can reduce fuel costs by reducing auto trips and require less linear footage of utility systems and roads. In summary, land use, transportation, and utilities planning can affect an activity's energy consumption.

2. Long-Range Utilities and Energy Plan

a. General. Marine Corps policy is to properly plan for and maintain its real property in the most efficient and cost-effective manner. To accomplish this, public works and facilities maintenance divisions must both plan to replace and expand utilities systems and perform specific and continual maintenance on these systems. An integrated approach to utilities management will:

(1) Guard utilities systems against more costly repairs.

(2) Extend the useful life of utilities systems.

(3) Reduce annual costs over the life of the utilities.

(4) Permit orderly development of workload and allocation of resources.

(5) Plan, program, and construct needed plant expansions and replacements.

b. Description. Each activity shall develop a long-range utilities and energy plan. It should be updated annually by

1 October. The plan should cover a 5-year period and include all work to be accomplished regardless of source funding; i.e., operation, maintenance, repair, overhaul, training, construction, and studies. The plan does not need to be elaborate but should be detailed enough to provide a framework to measure goal attainment and provide input to the budget process. Figure 2-4 shows the input to the Long-Range Utilities and Energy Plan.

2202. MARINE CORPS ENERGY CONSERVATION GOALS AND OBJECTIVES. Activities should use the goals described below as a guide when developing their energy management programs. Goal accomplishment will be measured against the FY 1985 baseline (1 October 1984 to 30 September 1985).

1. Facilities Energy Goals

a. Reduction of Energy Use in Administrative and Similar Type Buildings. Reduce energy used per gross square foot in these types of buildings by at least 20 percent by FY 2000. This goal applies to leased facilities, except when determined infeasible by the CMC.

b. Industrial-Type Facilities. By FY 2000, reduce energy use per gross ft(2) by 20 percent as compared with FY 1985.

2. Facilities Plans to Attain Energy Goals

a. Improve Operations and Maintenance. A trained, skilled workforce and timely maintenance programs are key elements in improving the operating efficiency of facilities and utilities systems. Examine existing utility/energy programs and facilities and prioritize improvements which can be obtained through operator training and maintenance of production, distribution, and related systems. Plan to use OMES contracts to identify facilities and utilities improvements and as a means of accomplishing rapid payback energy projects on time.

b. Capital Investment. Design investment plans which include a total statement of requirements for energy conservation projects regardless of the source of funds or method of contracting. The Energy Initiatives Program (EIP) O&M funding and the ECIP using MILCON funding are available sources of funds for investments in projects planned to meet energy program goals. ECIP MILCON projects will be prioritized by the highest auditable energy and/or cost having projected and not solely by shortest payback. MILCON or O&M projects must payback in 10 years or less, and rapid payback projects suitable for OMES contracting must payback in 2 years or less. Investment plans should include those projects which are suitable for alternative funding. Rebates or financial incentives offered by utility companies should be included in the economic analysis for a project.

c. Public Utility Systems. Regulated public utility companies sponsor incentives programs for their customers to save energy. Activities should seek to participate in electricity demand side management (DSM) and conservation programs when and where such programs are offered by public utility companies. Activities are encouraged to: (1) enter into agreements with utility companies or utility company-approved, competitively selected, contractors which provide facility energy conservation audits, at no cost or obligation to the Government, (2) apply for and accept approved financial incentives, such as energy efficient equipment rebate or project feasibility study cost sharing, offered by utility company programs, (3) enter into direct negotiations with utility companies or utility company-approved, competitively selected, contractors for the installation of energy efficient, demand reduction or power reduction equipment where utility incentives cover a portion or the entire implementation costs.

d. Alternative Funding. Alternative funding methods are discussed in chapter 3, section 5.

e. Lighting System. Advances in outdoor and indoor lighting systems concepts and products, which because of the large scale nature of the situation at activities, can payback rapidly and result in major savings in energy use and cost. In outdoor (and high bay) lighting, high pressure sodium and metal halide lamps used in conjunction with timers controls and photoelectric cells have been found to save energy and dollars. In indoor lighting: compact fluorescent light bulbs, high efficiency fluorescent lamps electronic ballasts, specular reflectors and; changing exit lights to a self-luminent, electro-luminescent, or a light emitting diode (LED) type has also achieved savings. Lighting projects are ideal for funding under an OMES contract using O&M funds. Upon request, the Defense Logistics Agency (DLA) will distribute information on lighting equipment and economic analysis guidelines to assist in the selection of energy efficient lighting systems and equipment.

f. Alternative, Renewable, and Clean Energy. This category of energy includes those from uncoventional sources such as energy recovered from conversion, and energy producing low environmental emissions. Some examples are solar energy, photovoltaics wind energy, geothermal energy, landfill methane, fuel cells, hydrogen combustion, etc. The Department of Energy (DOE) has demonstration programs for projects which involve these types of energy.

Activities are encouraged to: participate in DOE demonstration programs where determined to be cost-effective and compatible with their mission and; use alternative renewable, and clean energy sources wherever such use can be shown to be cost-effective over the life of the facility.

g. Use of Coal. Where economical and environmentally feasible, activities having coal burning capabilities are encouraged to increase their use of coal. Where new energy system decisions are concerned, activities are required by statute (10 USC 2690) to use the lowest life-cycle cost fuel.

3. Environmental Aspects of Energy Conservation

a. Environmental Compliance and Least Cost Planning. Conservation and energy efficiency improvements need to be consistent with environmental statutes and regulations. In planning energy programs, particular attention should be paid to those actions which achieve environmental compliance through conservation at the least combined cost. MCO P11000.18 prescribes means by which the energy impacts of meeting environmental quality goals, such as chlorofluorocarbon (CFC) replacement, will be measured and energy conservation efforts to minimize these impacts evaluated.

b. Environmental Benefits of Conservation. The environmental benefits of conservation action, such as reduced carbon dioxide or nitrous oxide emissions, will also be measured. A coordinated, auditable measurement method is being developed. To the extent permitted by law and regulation, the measurement method will address the potential for exchanging or trading environmental and conservation benefits.

4. Retention and Use of Savings from Energy Conservation Investments. Congress has provided financial incentives for energy conservation by granting authority to retain and reuse energy cost savings. One-third of the savings will be retained by HQMC for additional energy conservation investments and one-third will be retained by the activity for improvements in family housing, quality of life, minor construction projects, or morale, welfare and recreation. Activities are directed to comply with the following in a way that assures savings retention and continuing incentives for energy conservation at the activity:

a. Provisions contained in section 736 of PL 100-456 (1988) as amended by section 331 of PL 101-189 (1989) concerning measurement, retention and use of savings from SES contracts. Retention of savings from SES contracts are different than other savings retention in that the activity initiating the contract is authorized to retain the Government’s share of the cost savings for the first 5 years of the SES contract. After the first 5 years, the savings retention will be treated the same as other energy conservation projects.

b. Provisions contained in 10 USC 2865 with respect to retention and use of savings from energy conservation projects generally.

>Ch 3 5. Progress and Reports. Activities will report progress towards meeting the reduction goals quarterly using the DUERS, Utility Energy Report System (Report Control Symbol (RCS) DD-4100-02). (See appendix L for instructions on contents and completion of the DUERS Report.) The quarterly DUERS Report should also contain narrative descriptions of special situations such as shared energy savings projects and, energy conservation projects financed by operations and maintenance or other fund sources by project type. An annual report will be made to summarize all of the information contained in the quarterly reports and contain details of how the retention and savings (paragraph 2202.4) were spent at the activity. Audit trails of savings retention and reinvestment spending will be maintained at the activity level.

6. Baseline Computation Information. Use the following procedures to update the 1975 baseline (to FY 1985) in terms of MBtu per thousand square feet to obtain a current standard against which the building energy conservation goals established in Executive Order 12003 are measured.

>Ch 3 a. The 1985 consumption will be actual consumption for 1 October 1984 to 30 September 1985 as reported on DUERS reports (see chapter 5).

>Ch 3 b. All activities reporting on DUERS shall determine and report a one-time baseline. No baseline changes will be allowed without approval of the CMC (LFF). All previous baselines are void.

c. Conversion factor or megawatt hour to MBtu is:

1 MWH + 3.413 MBtu

d. The CMC (LFF) will monitor new construction and apply a weighted goal, as shown in the example in figure 2-5, to activities having new construction.

2203. UTILITIES SYSTEMS ASSESSMENTS

1. Scope. A survey of utilities systems or portions thereof, generally to correct operational deficiencies, is performed by the EFD and utilities engineer and funded with mission management funds.

2. Process. These analyses involve the study of production, purchase, distribution, and use of utilities systems. Normally, the EFD performs these analyses, following guidance in NAVFAC MO-304. However, if required, a consulting engineering firm

may be used. Recommendations/findings of these analyses shall be included in the Long-Range Utilities and Energy Plan (paragraph 2201).

2204. FACILITIES ENERGY SOURCE SELECTION CRITERIA

1. Background. The following provides heating fuel and energy selection criteria which apply to all Marine Corps activities. Additional information on heating system design and criteria is in DoD 4270.1-M and associated MIL-HDBK-1190. Present fuel use policy requires that the primary fuel source to be used in any new heating system be the most cost-effective fuel for that heating system over the life-cycle of the system.

2. Specific Information. Where third party capital ventures appear to be warranted, technical assistance shall be requested from the cognizant EFD. If air pollution laws or regulations dictate deviations from the enclosed fuel requirements, submit requests for exceptions to the CMC (LFL). The request must include a full review of the situation along with alternatives, and must be submitted before design is started. This guidance does not apply to the Marine Corps Reserve.

3. Energy Source Selection for Defense Facilities (Located in the Contiguous States)

a. All facilities will be tied into the basewide heat distribution system. If such a system does not exist, or it is otherwise not feasible based on the life-cycle costing, the fuel selection criteria which follow shall apply:

b. Public, Private Ventures (PPV) for Energy/Utilities

(1) Definition. PPV for energy/utilities represents a new method of utilities management within the Marine Corps. Such ventures can be defined as business arrangements by which the Government receives a service developed through the use of private financing. It is also referred to as "shared energy savings," "privatization," "alternative financing," "venture capital financing," and "private financing." Appendix G addresses the standard operating procedures and details of implementing a PPV project.

(2) Background. Privatization is a means of contracting for certain in-house programs and functions when they can be more efficiently provided by the private sector. The key to this is finding ways to attract private entrepreneurs, businesses, utility companies, and other organizations to provide necessary facilities and/or services that have traditionally been provided through the

Government budgeting process. The private developer may finance, design, construct, own, operate, and/or maintain Marine Corps facilities and utilities systems to generate revenues either from power sales to regulated utilities or customers, from energy conservation measures, from refuse derived fuel plants, or other projects the developer may propose. The Marine Corps would share in the revenues and avoidances with the developer. The advantages of such a partnership with a private developer include no Government investment, shifting of the performance risk to the developer, immediate incentive to generate savings, repair of energy utilities system deficiencies, and resolution of system capacity expansion problems, and decreased energy vulnerability. Disadvantages include giving up some potential dollar savings to the developer, private ownership of installed equipment, transaction costs, complex business negotiations, real property acquisition limitations, and non-FAR standard contracts. By working closely with the local regulated utility, developer, and contracting officers, an arrangement can be formulated and awarded which contains enough incentives for all partners to assure a long, nonadversarial relationship.

(3) Legislation. PPV began several years ago with the passage of special legislation enabling the Government to enter into long-term contracts funded from annual appropriations. The following is a listing of legislation relevant to the use of PPV for utilities services:

(a)	10 USC 2394	Contracts for Energy or Fuel for Military
(b)	10 USC 2483m	Sale of Electricity from Alternative Energy and Cogeneration Production Facilities
(c)	10 USC 2809	Test of Long-Term Facilities Contracts
(d)	42 USC 8201	The National Energy Conservation Policy Act (NECPA)

(4) Utilities Services. The following utilities services have been identified as potential PPV projects:

(a) Electrical, steam, chilled, and hot water generation.

(b) Cogeneration.

(c) Compressed air.

(d) Refuse derived fuel and municipal solid waste plants.

(e) Sanitary waste treatment.

(f) Industrial or hazardous waste.

(g) Various alternative energy sources where economical.

(5) Shared Savings. Additionally, basewide energy conservation projects can be packaged with the cogeneration or other power sales project. Such "shared energy savings" projects might include the following:

(a) Preventative maintenance of steam traps.

(b) High efficiency boilers.

(c) Lighting retrofits.

(d) Insulation and window projects.

(e) Basewide energy monitoring and control systems.

(6) Implementation Steps. Procedures for processing PPV projects are grouped into four main phases, each culminating in a key milestone decision on whether to proceed with privatization. The four phases are:

(a) Preliminary Analysis. Privatization concepts are examined to determine if they are feasible to satisfy a validated requirement. This phase also examines whether there is enabling legislation for the proposed application.

(b) Evaluation of the Alternatives. Privatization is analyzed and compared to alternatives, such as new construction, to determine whether it is economically feasible and politically acceptable. This phase culminates in a decision on whether to seriously pursue the privatization alternative.

(c) Authorization and Approval. Authorization and approval is obtained to issue a request for proposals (RFP) and pursue a privatization project. In some cases, this may require Secretary of the Navy, Office of the Secretary of Defense (OSD), and/or congressional approval.

(d) Implementation. This phase includes the final decision on privatization. It consists of preparing acquisition and management plans, conducting source selection, and negotiating contracts or leases.

Successful application of privatization requires creativity and innovation. Experience shows that the best results are achieved when a dynamic proponent is appointed to take the lead in planning, packaging, and implementing a privatization proposal. The proponent should assemble an interdisciplinary project team to aid in working the project; teamwork is the key to success.

(7) Programming and Approval Requirements. The development of privatization initiatives does not differ substantially from normal planning and programming procedures. Privatization projects are expected to be included in the Programming, and Budgeting System (PPBS) and the Program Objective Memorandum (POM). The fundamental criteria for viable privatization projects include having a validated requirement, available land if the PPV project is to be located on base community and political support, and private sector sector interest.

c. Energy Source Selection. If paragraphs 2204.3a and b do not apply, use the following criteria:

(1) Coal

(a) Coal is an energy source with a projected future supply greater than the projected future demand. The design of all large boiler heating and power plants should strongly consider the use of coal whenever life-cycle is cost-effective.

(b) New Plants. New plants over 50 MBtuh input can be designed and constructed to burn coal and/or a solid fuel such as RDF or biomass. Particulate collectors necessary to meet air pollution abatement regulations shall be installed at the time of construction. The design shall provide for the future addition of sulfur removal equipment in case the high sulfur coal supply becomes economically attractive in the future. Where coal meeting the air pollution regulations for sulfur is not available or other compelling or overwhelming economic considerations exist, the plant may be of convertible design. A coal convertible design uses boilers increased in size to accommodiate future coal combustion but is arranged to burn oil and/or natural gas, and space is provided for future particulate collectors, flue gas sulfur removal equipment, and solid fuel ash handling and storage facilities. Close attention to environmental regulations and air pollution control equipment availability will be required. The Defense Fuel Supply Center should confirm coal availability before the design of a coal burning plant is started.

(c) Replacement boilers or additional boilers for existing plants will continue to burn the present fuel, unless the outcome of a life-cycle cost analysis determines otherwise.

(2) Fuel Oil and Natural Gas

(a) 0-5 MBtuh Input. Fuel oil or natural gas may be selected based on life-cycle cost analysis.

(b) New Oil Fired Plants, Replacements, or additions (5 MBtuh up to 50 MBtuh). All new oil fired plants of 5 MBtuh and up to 20 MBtuh input must be capable of burning all grades of fuel oil through No. 5. All new plants 20 MBtuh through 50 MBtuh shall be capable of burning all grades of fuel oil through No. 6. These requirements do not apply where oil is the alternative fuel in a dual fuel plant. Replacements and additional boilers shall be capable of burning the widest range of fuels presently provided in the existing facility.

(c) New Gas Fired Plants, Replacements, or Additions (5 MBtuh up to 50 MBtuh). Use natural gas only if shown to be cost-effective and with reasonable assurance from the local supplier of gas availability. A dual fuel, oil standby capability may be provided based on natural gas interruptibility requirements.

(3) Liquefied Petroleum Gas (LPG)

(a) Due to uncertain availability in times of fuel shortages, and because designers are less familiar with the operating and maintenance characteristics of this fuel, its use is not encouraged.

(b) 0-1 MBtuh input. Select fuel based on life-cycle cost analysis.

(c) Use of LPG 1 MBtuh and above but less than 50 MBtuh input. Any use of LPG in a plant of this size will require approval of the CMC (LFF).

(4) Electric Heating. The availability and reliability of ample electric power in the future are uncertain. Combined with the poor energy efficiency in generation and distribution of electric power, the use of electricity consumes the greatest Btu equivalent and highest cost of common energy forms. Accordingly, in the planning of energy use, electricity will be given careful scrutiny to minimize and conserve its use and full consideration of more energy efficient forms shall be made. The use of cogeneration, heat pumps, and heat recovery techniques is encouraged where economically justified. Use of electric resistance heating for personnel comfort is prohibited except for the following:

(a) Where used as supplemental heating in a heat pump.

(b) Where the total load is less than 15,000 Btuh, and resistance heating is the most economical option on a life-cycle basis.

(c) Where a life-cycle cost analysis indicates its cost effectiveness, there is assurance of availability from the local utility, and approval of the CMC (LFF) is obtained.

(5) Renewable, Geothermal, Solar, Biomass, and Synthetic Fuel. The military departments are strongly encouraged to monitor and support development of these alternate energy sources. Specific application of these nonconventional energy sources shall be made wherever life-cycle is cost-effective and where reliable technology is available.

(6) Refuse Fuel

(a) Use wherever life-cycle cost is effective and practical in comparison with other alternatives.

(b) Mass burning of unprocessed raw refuse has been sucessful in several municipal applications.

(c) RDF is derived by a size reduction and sorting process of industrial or municipal wastes. It can be economically procured as a large slake suitable for overfeed stoker systems. The cost of processing, however, increases the fuel cost; therefore, a thorough analysis of life-cycle costs is necessary.

(7) Waste Oils. A gallon of waste oil contains almost the same energy potential as a gallon of new oil. Waste oil can be successfully burned in water and fire tube boilers without significant air pollution or operational problems. Specific applications shall be made wherever the life-cycle cost is effective and practical in comparison with all other available alternatives. Activities are encouraged to investigate the economic benefits of supplemental use of waste oils wherever a significant source exists. Refer to paragraph 4204. 1c, for additional guidance.

(8) Application Criteria

(a) Energy Storage. To prevent mission support disruption from liquid fuel supply problems, defense energy plants shall be provided with a minimum supply level of no less than 30 days of the maximum expected continuous demand. All coal fired plants shall be provided with a minimum of 90 days supply.

(b) Dual Fuel Capability. Since the primary objective of defense heating and power plants is to provide mission support during all conditions, all major plants and systems shall

be installed with dual fuel (oil and/or natural gas) capability where economically feasible. This backup capability will allow the installation commander flexibility to provide mission support during specific fuel supply interruptions and to take advantage of temporary fuel costs savings.

(c) Fuel Substitution. Fuel shortages have created situations requiring the consideration of alternative substitute fuels for power generation, construction, transportation, and heating. Numerous tests and extensive operating experience have demonstrated that successful substitute fuels are available for diesel fuel, heating oil, and gasoline. It is important that each activity determines those alternative fuels which can be acceptably fired in existing equipment and what modifications are needed to implement the substitution. Installation contingency plans should include an implementation program detailing the mechanical system alterations and changes in maintenance policy required to use alternate fuels.

(d) Pollution Abatement. All Marine Corps facilities must be assigned, operated, maintained, and monitored to conform to applicable air and water pollution standards established by Federal, State, and local authorities.

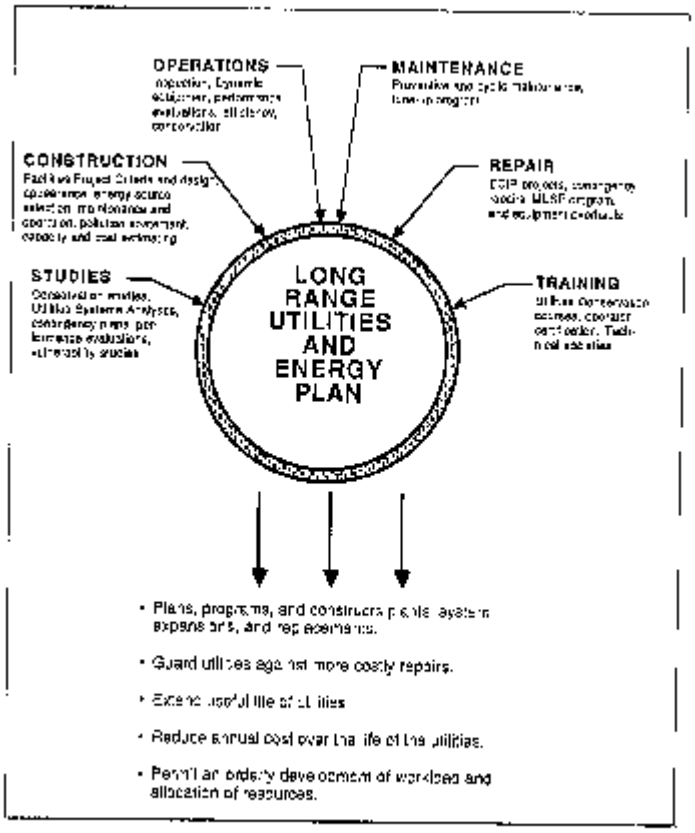
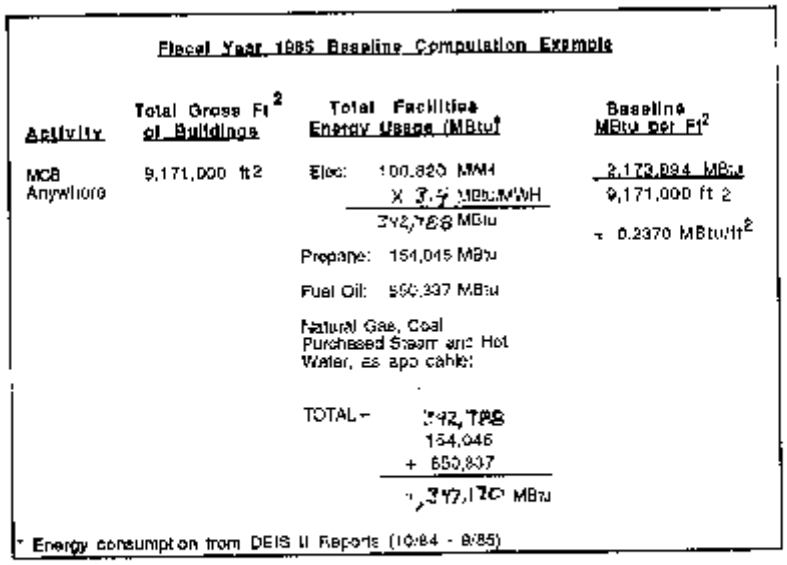


Figure 2-4.--Long-Range Utilities Planning Structure.



Fiscal Year 1985 Baseline Computation Example

Activity	Total Gross Ft² of Buildings	Total Facilities Energy Usage (MBtu)*	Baseline MBtu per Ft²
MCB Anywhere	9,171,000 ft2	Elec: 100,820 MWH X 3.4 MBtu/MWH 342,788 MBtu Propane: 154,045 MBtu Fuel Oil: 550,337 MBtu Natural Gas, Coal Purchased Steam and Hot Water, as applicable: TOTAL = 342,788 154,045 + 550,337 1,047,170 MBtu	2,173,894 MBtu 9,171,000 ft 2 = 0.2370 MBtu/ft²

* Energy consumption from DEIS II Reports (10/84 - 9/85)

Figure 2-5.--Fiscal Year 1985 Baseline Computation Example.

CHAPTER 2

ORGANIZATION

SECTION 3: PROCUREMENT

2300. GENERAL. Whenever economically feasible, utilities services shall be procured from commercial sources, or by cross-servicing with adjacent Government activities, in lieu of construction or expansion of Marine Corps-owned utilities. See MCO 4860.3 for policy and procedures governing the starting, expanding, or curtailing of in-house utilities services.

2301. PURCHASED UTILITIES

1. Control of Peaks. To ensure that the lowest possible costs are paid for purchased utilities, Marine Corps activities shall establish controls and/or procedures which activate load shedding actions when the usage of a commercial utility is approaching a pre-established peak demand.

2. Billing Economics. Whenever economically justified and allowed by the utility supplier, utility bills shall be combined to take advantage of lower rates. Assistance in determining the economic savings and conditions under which the utility supplier will allow combination of bills can be obtained from the EFD.

3. Dual Fuel Capability. To meet the primary objective of mission support during all conditions, major defense heating and power plants shall be converted to dual fuel capabilities when economically feasible. This backup capability allows for continued mission support during fuel supply interruptions and use of less expensive fuels. Assistance in preparing an economic analysis can be obtained from the EFD.

2302. PROCUREMENT OF UTILITIES SERVICE WITH A CONTRACT

1. Authority. EFD's of the NAVFACENGCOM will negotiate, award, and administer all utility service contracts for Marine Corps activities, except as discussed in paragraph 2303.

2. Requisitioning Procedures. In accordance with NAVFAC P-68, Contract Administration, and the procedures established by the EFD, Marine Corps activities shall request procurement of all commercial utility services.

>2303. ACQUISITION OF DIRECT SUPPLY NATURAL GAS

1. Background. The deregulation of and subsequent increased competition in the natural gas transportation and supply industries have provided the opportunity for substantial energy cost savings for customers able to participate in the acquisition of direct supply natural gas. This paragraph implements DoD policy and guidance promulgated in Defense Energy Program Policy Memorandum (DEPPM) 93-1, Centralized Competitive Acquisition of Direct Supply Natural Gas, dated 12 January 1993.

2. Policy. It is Department of Defense and Marine Corps policy to acquire natural gas through the Defense Fuel Supply Center (DFSC) under the Defense Logistics Agency (DLA) Direct Supply Natural Gas Program.

a. The basic objective of centralizing acquisition of direct supply natural gas is to meet customer natural gas requirements in the most cost effective and efficient manner.

b. Ensuring mission support and the appropriate reliability of supply will take precedence over all other considerations in natural gas acquisition.

3. Participation. All Marine Corps installations utilizing natural gas will participate in the DFSC natural gas program except as provided in paragraph 4, below.

4. Exceptions to Participation. DFSC and the Marine Corps may mutually agree not to include an installation in this program on the basis of obvious uneconomic potential or other grounds. The primary grounds for exemption from this program are:

a. The local distribution company (LDC) will not provide transportation from the citygate;

b. Base realignment and closure (BRAC) actions;

c. Existing contractual arrangements with the LDC or with existing multi-year direct supply natural gas suppliers with better prices or with termination liabilities exceeding DFSC direct supply contract cost benefits;

d. Loss of utility-sponsored demand side management (DSM) program benefits that are greater than the potential savings available via the DFSC direct supply natural gas program;

e. Ongoing or pending legal or regulatory action in which the government’s interests would be adversely affected by participation in this program;

f. Mission support and the appropriate reliability of supply has taken precedence over all other considerations in natural gas procurement;

g. DFSC program does not meet minimum LDC requirements;

h. There is insufficient savings potential (small activities/installations).

5. Data Submission. Installations shall provide data as required on historical and projected requirements for both interruptible and firm gas, alternative fuel capability and associated site costs sufficient to allow economic evaluation by DFSC of the potential for inclusion in a contract solicitation. They shall also provide any special or installation specific requirements or constraints, such as special service arrangements with the LDC, which may need to be identified in a solicitation. This submission will generally be in response to a data call from the DFSC and will be on a DD Form 2692, Direct Supply Natural Gas Requirements.

6. Economic Analyses. Economic analyses will be conducted by DFSC for each installation to determine the potential for cost effective participation in a contract. Installations should participate in the joint review of the DFSC economic analysis to ensure installation specific data (including technical specifications such as the allowable number of days of interruption) used in the analysis are correct. Installations may also perform an economic analysis, with EFD assistance if needed. Any differences between the results of the economic evaluations should be reconciled with DFSC via the EFD.

a. Cost Factors for Economic Comparisons. Cost factors for economic comparisons include the cost of the natural gas commodity; applicable pipeline transportation, storage and backup, or standby charges (as applicable and appropriate) for the installation; and established operating, general, and administrative costs directly associated with this program.

b. Cost Effectiveness. The estimated total annual and average unit cost (measured at the burner-tip) of the direct supply natural gas provided to an installation through this program, or the comparable per unit cost of any alternative energy readily used by the installation, shall be lower than that offered by the LDC at the time of contract award.

7. Administration and Support. Participating installations shall provide the necessary administrative support for postaward supply management, nomination, balancing, and payment functions if a contract is awarded, and shall:

a. Ensure that installation personnel associated with DFSC direct supply natural gas contracts and LDC pipeline transportation agreements are properly trained in the use of these contracts. DFSC will arrange regional training to meet this requirement;

b. Nominate and issue delivery orders against the DFSC direct supply natural gas contracts;

c. Make timely payments to contractors for direct supply natural gas and LDC services, unless payment responsibility has been assigned otherwise;

d. Develop, program, and execute necessary budgets to meet their obligations under the direct supply natural gas program;

e. Report promptly any problems with direct supply natural gas delivery or contract solicitation information to DFSC.

8. Annual Submission - Installation Administrative Costs. Participating installations shall provide annual installation administrative costs associated with performing preaward and postaward functions by 15 November of each year to DFSC via the EFD for incorporation in the annual DFSC report.

9. Additional Information

a. Points of Contact. The following are the technical and program management points of contact in HQMC, DFSC, and the service utility management offices (SUMO):

1. Commandant of the Marine Corps
   ATTN: LFF-1
   2 Navy Annex
   Washington, DC 20380-1775
   Phone 703-696-0858/59
   DSN 426-0858/59

2. Defense Logistics Agency, Defense Fuel Supply Center
   ATTN: DFSC-A
   8725 John J. Kingman Rd, Suite 4950
   Ft. Belvoir, VA 22060-6222
   Phone 703-767-8571
   DSN 427-8571

3. Department of Navy, Naval Facilities Engineering Command (SUMO for Policy Issues)
ATTN: Code 165
Alexandria, VA 22332-2300
Phone 703-325-0135
DSN 221-0135

4. Department of Navy, Commanding Officer Northern Division (SUMO for Technical Issues)
NAVFACENGCOM, ATTN: Code 164
Philadelphia, PA 19112-5094
Phone 215-595-0655
DSN 443-0655

b. Additional detailed information describing DFSC and EFD program responsibilities, the contracting process and contract management requirements is provided in appendix M.

CHAPTER 2

ORGANIZATION

SECTION 4: SALES

2400. AUTHORITY

1. Utilities services may be furnished using appropriated funds on a reimbursable or nonreimbursable basis to customers authorized herein.

2. Activity commanders are responsible to supply consumers with essential utilities services per regulations applicable to nonindustrial activities, as prescribed in the NavCompt Manual, volume 3, chapter 5, and as modified or amlified by these instructions.

2401. SALES TO PRIVATE PARTIES

1. Policy. Private parties, including municipalities and public institutions, will secure utilities services from local private or public sources. Such services will be furnished by a Marine Corps activity only in cases of extreme urgency involving national defense, natural disasters, or public health and safety. Such services can be furnished only when not available from local private or public sources. When a request for such service is received, the party involved shall be referred to the local supplier. Activity commanders shall ensure that every effort was made by the private parties to persuade the local supplier to provide the service.

2. Contracts. The activity commander or designated representative is authorized to prepare, award, and execute contracts to sell utilities services to private parties per NAVFAC P-68.

3. Periodic Review. Utilities services are furnished to private parties on a purely temporary basis. Circumstances surrounding the sale of a utility service shall be reviewed at least once a year by activity commanders, with a view towards discontinuing such service at the earliest practicable date. All possible alternative sources shall be explored. In addition, when the private party has made a commitment as to a future course of action to obtain an independent source, efforts shall be made to see that such commitments are carried out.

2402. UTILITIES UNIT RATES

1. Establishement. Activities shall determine charges for utilities services rendered to customers by applying unit rates. Paragraph 2406, following, provides details.

2. Activities. Minor Marine Corps activities which receive utilities services from a host activity may eliminate billings to customers by requesting the host command or other supplier to bill customers directly.

2403. ESTABLISHED ACTIVITY RATES. The established activity rate for each type of utility shall be applied to metered or estimated quantities of service if services are furnished the following consumers:

1. Utilities for Morale, Welfare Recreation (MWR) Category D (business activities) in the CONUS may not be supported from appropriated funds. Category D activities will be charged the activity rate for each type of utility. Utilities for MWR categories A, B, and C may be supported from appropriated funds within CONUS, except for temporary lodging facilities. Utilities for all MWR categories may be supported from appropriated funds outside of the CONUS.

2. Utilities for commissaries in CONUS are charged to the Commissary Trust Fund at the activity rate. Utilities for commissaries outside of CONUS may be supported by appropriated funds.

3. Family housing.

4. Naval medical and dental facilities.

5. Other military installations or agencies of the Federal Government.

6. Cost accounting purposes; e.g., Marine Corps bakeries and laundry and dry-cleaning plants.

2404. PRIVATE PARTY RATES

1. When Applied. Private party rates shall be charged for utilities furnished to consumers other than those stated in paragraph 2403, preceding; e.g., State and municipal government, tenants of rental housing, contractors, etc.

2. Comparability. When private party rates are less than commercial rates, the activity shall add an amount to bring the rate

in line with prevalent commercial rate. Comparability rates will be based on similar service from public or private suppliers in the general area of the activity.

2405. VENDING AND AMUSEMENT MACHINES. Vending and amusement machines are included under MWR Category D (Business Activities). Guidance in paragraph 2403.1 pertains.

>2406. UTILITIES COST ANALYSIS REPORT (UCAR) AND RATE SETTING

1. Background

a. Definitions. In accordance with NAVCOMP MANUAL, Change #362, paragraph 037301.

(1) UCAR. The Utilities Cost Analysis Report (NAVCOMP Form 2127) is a report of quantitative and cost data for producing, purchasing, and delivering utility services.

(2) Established Activity Rate. The rate or rate structure at which all DoD activities receiving utilities service are required to reimburse the activity providing the service.

(3) Private Party Rate. The rate or rate structure at which all non-DoD activities receiving utilities service are required to reimburse the activity providing the service.

(4) Utilities System. A utilities system is a single real property facility which may include generation plant equipment, distribution lines and associated distribution equipment, and the buildings or structures to house or support these equipment components.

b. Intent

(1) UCAR. The UCAR is intended to serve management at the installation level, as well as higher levels, by providing the following:

(a) Information needed to set the established activity rate and the private party rate to bill customers of utility service.

(b) Information needed to prepare a utilities budget.

(c) The unit cost of each utility service produced, purchased, and/or delivered.

(d) Information to track utilities expenditures.

(e) Information to determine whether operations are proceeding efficiently and according to plan.

(f) Early indicators of problem areas and suggestions of opportunities for improvement.

(2) Rate Setting

(a) Utilities will be provided to all customers on a reimbursable basis. Rate setting establishes the reimbursement rate so that the cost of providing utilities services is applied uniformly to all customers served by the utility system.

(b) A rate structure may be established to equitably recoup costs resulting from rate structures applied by utilities providers.

2. Application

a. Reporting Activities. A separate UCAR will be prepared for each independently operating utility system. Specific instruction on which activities must report is found in NAVCOMP Manual, paragraph 037313.1.a.

b. Report Periods

(1) Quarterly reports will coincide with fiscal quarters.

(2) The annual report period ends 30 September.

c. Report Preparation. The UCAR will be prepared per the instructions found in NAVCOMP Manual, paragraph 037313.7.

3. Responsibilities

a. Installation

(1) Train UCAR personnel. Training is available through NAVFAC on the preparation of the UCAR. Contact the CMC (LFF-1) for class dates and locations.

(2) Gather Data

(a) Labor costs from the installation comptroller.

(b) Materiel costs from the appropriate supply documents.

(c) Fuel consumption and utility operation data from the activities providing utilities services.

(3) Prepare UCAR

(a) Installations with annual utilities expense of over $500,000 will prepare the UCAR quarterly.

(b) Installations with annual utilities expense of less than $500,000 will prepare the UCAR annually.

(c) Installations purchasing all utilities from other DoN installations are not required to prepare the UCAR.

(4) The installation utilities office will submit the UCAR no later than the last day of the month following the last month of the reporting period (e.g., the report for the first quarter is due by 31 January).

(a) Distribution of quarterly reports will be; two copies to the installation Publics Works Department, one copy to the EFD, and the original copy to the CMC (LFF).

(b) Distribution of annual reports will be; two copies to the installation Publics Works Department, one copy to the EFD, one copy to NAVFACENGCOM Headquarters (Attn: Code 165), and the original copy to the CMC (LFF-1).

(c) Installations are encouraged to submit the report in digital form. A Lotus 1-2-3 spreadsheet template is available from the CMC (LFF-1).

(d) A copy of the Reimbursable Customer Worksheet must accompany each submitted UCAR. This list will show each customer, work units sold, the rate applied, and the amount charged each customer for each utility.

(5) Set Established Activity Rate

(a) Applicability. All DoD customers will be billed at the established activity rate for each utility system that they use. See NAVCOMP Manual, paragraph 037305 for specific applicability of the established activity rate.

(b) Calculation. A sample calculation of the established activity rate is shown in figure 2-6.

(c) Frequency of Revision. The established activity rates will remain in effect for an entire fiscal year unless increased costs make a rate change essential. Annual changes will be made when the UCAR for the previous fiscal year indicates a net gain or loss of 5 percent or more of the utility’s cost.

Customer notification must take place at least 90 days prior to implementation at the beginning of a fiscal quarter.

(6) Set Private Party Rate

(a) Applicability. All non-DoD customers will be billed at the private party rate for each utility system that they use.

(b) Calculation. The private party rate will be calculated in accordance with the instructions in the NAVCOMP Manual, paragraph 035880.

(c) Frequency of Revision. The private party rate may be revised on a quarterly basis. Revisions are required when changes in the costs affecting the rate calculations change.

b. HQMC

(1) Review UCAR. Check annual submissions for data accuracy and consistency with the DUERS report.

(2) Provide Forms. Provide electronic forms to activities.

(3) Provide Assistance. Assist activities in analyzing UCAR data. Support training for personnel involved in preparing and using the UCAR. Provide technical support of electronic forms provided to activities as necessary.

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

N_{total} = number of central heating plants owned by Marine Corps Activity "A".

a_N = total cost of utilities delivered (line 36 of NAVCOMPT Form 2127) by N^{th} heating plant.

b_N = net quantities delivered (line 17 of NAVCOMPT Form 2127) by N^{th} heating plant.

$$\text{Activity Rate for heat supply} = \frac{\text{Sum of total costs of utilities delivered for all heating plants.}}{\text{Sum of the net quantities delivered for all heating plants}}$$

Example: Marine Corps activity "A" has two heating plants: 1) and 2)

	total cost of utilities delivered	net quantities delivered
1)	3,195,000	360,000 x 10^6 BTU
2)	208,000	26,000 x 10^6 BTU

$$\text{Activity Rate} = \frac{3,195,000 + 208,000}{360,000 + 26000}$$

$$= \frac{3,403,000}{360,000 \times 10^6}$$

$$= \$8.816 \text{ per } 10^6 \text{ BTU}$$

1. Activities are cautioned that maintenance costs (line 26a, b, and c, and 34a, b, and c of NAVCOMPT Form 2127) shall include only recurring maintenance expenses (category M1).

Figure 2-6.--Determination of Activity Rates.

> Figure 2-6.--Determination of Activity Rates

SECTION 5: UTILITIES CONSUMPTION AND RATE INCREASES/DECREASES

2500. DEFINITION. All purchased utilities are defined in NavCompt Manual, volume 2, chapter 4, paragraph 024601.10, Functional Category N, and include electricity, steam, hot water, sewage, and fuel used for heating or electric power generation. Utilities for which reimbursement is required by the NavCompt Manual, volume 7, chapter 2, and volume 3, chapter 7 are excluded from the reporting requirements which follow.

2501. BACKGROUND

1. Utilities costs are expected to increase in the future. However, rates charged for utilities services are subject to review by the regulating authority; i.e., public utilities commission. Early notification of a proposed rate increase will allow for rebuttal, if appropriate. Notification is usually in the form of an announcement sent with the monthly utility bill. Newspaper articles will often provide advance notice.

2. In the past, significant utilities and fuel rate increases have been imposed on Marine Corps activities after submission of the Marine Corps budget to Congress. Budget directives preclude the inclusion of "anticipated" price increases in budget submissions. However, requests for increases in appropriations at the Headquarters level may be permitted based on rate increase notification or actually documented rate increases. Accordingly, all official notices of rate increases and their estimated financial impacts shall be forwarded to HQMC for use in budget justification.

3. New construction or demolition of existing facilities and climatic/mission factors increase or decrease projected consumption of utilities in the period between fiscal budget submission and the end of the budget year. HQMC will consider requests for increases in appropriations based on increased consumption due to new facilities or other documented factors.

4. Information is provided by the report described in paragraph 2503 to determine the final adjusted utilities portion of the financial ceilings for the budget year; to update the CMC of the financial plan after passage of the Defense Appropriation Act in each fiscal year; and to review and evaluate utilities funding requests at midyear, year end, and for the next fiscal year.

2502. ACTION

1. Proposed utilities rate increases. Advise the CMC (LFF) by message of all proposed utilities rate increases from regulated suppliers, public work centers, host activities, or others. Send an information copy of the message to (Code 02) NAVFACENGCOM and the cognizant EFD. Send the message as soon as possible after notification is received (announcement in monthly bill, newspaper article, etc.) and include an estimate of the cost impact.

2. Potential and actual utility consumption and rate increases or decreases. Submit to the CMC (LFF) a copy of each notice, schedule, or other official notice of utilities rate increases/decreases on the Operation and Maintenance, Marine Corps (O&MMC), or the Operation and Maintenance, Marine Corps Reserve (O&MMCR) appropriations, excluding reimbursable, in the format of the report in paragraph 2503. Fuel adjustment increases/decreases to electric utility rates are not considered rate increases/decreases for the purpose of this Manual. A separate submission of the report in paragraph 2503 for each potential and actual change in utilities consumption and/or rates is required. Each change shall reflect only the financial impact for that portion of the fiscal year in which the change is effective. Attach additional supporting information or data such as newspaper articles, utilities rate schedules, degree day calculations, etc., to the report.

a. Submit the report by 10 October to reflect the beginning of the fiscal year, within 15 days after receipt of a utility-rate adjustment notice or the realization of increased consumption requirements, and by November 15 to reflect the end of the fiscal year. This reporting requirement is exempt from reports controls.

b. All midyear review and other specific request for funding relief due to utilities rate and/or quantity increases/decreases must be documented by the reports required by this section. Actual funding adjustments will depend on the quality of the documentation provided.

c. The requirements of this section do not supersede or cancel any other requirement from the engineering field divisions of the NAVFACENGCOM for utilities rate increases/decreases information.

2503. INSTRUCTIONS FOR THE UTILITIES RATE INCREASES/DECREASES REPORT (RCS EXEMPT)

1. Preparation instructions are outlined below. Figure 2-7 provides a sample of a completed report.

a. Purchased Utility. Enter a specific purchased utility; e.g., electricity, steam, No. 2 fuel oil, natural gas, propane, water, etc. Use a separate sheet for each purchased utility for each fiscal year.

b. Column 1, Date. The first date entered in this column is the FY budget submission date with the word "budget" above. Subsequent entries in this column represent the dates of proposed or actual increases/decreases in consumption/rate of the purchase utility. The last entry in this column shall reflect the date any additional funds were provided by HQMC to finance unbudgeted requirements. If additional funds are provided on more than one occasion, each transaction should be recorded separately.

c. Column 2, Nature of Change. Enter in this column the coded alpha character(s) which explain the type of change(s) involved. Normally two, but in certain cases three alpha characters are to be used. The following is a listing of the applicable alpha characters to be used in this column:

A = Actual
P = Potential
C = Consumption
R = Rate

d. Column 3, Consumption. Enter the quantity of the purchased utility, in the appropriate units, anticipated to be consumed or actually consumed during the fiscal year. The first entry in this column shall be the fiscal year budget submission.

e. Column 4, Rate per Unit. Enter the cost per single unit of measure of the purchased utility; e.g., dollar ($), cents per kilowatt hour (kWh), or gallon (gal), or cubic foot (ft(3), etc., as appropriate. The initial entry in this column shall be the fiscal year budget submission rate which shall be based on the "then" current rate being charged for the purchased utility.

f. Column 5, Increases/Decreases in Cost for Effective Fiscal Year Period. Enter the cost impact in dollars of any change described by columns 2-4 for the period in which the change potentially or actually is effective; e.g., a change which is effective on 31 December has an effective fiscal year period of 9 months.

g. Column 6, Total Cost. The first entry in this column shall represent the FY budget submission amount of the purchased utility during the FY. The last entry in this column shall represent the total dollars obligated by the activity as of the end of the FY (30 September). The next to last entry shall

reflect the amount of additional funds provided by HQMC. If additional funds are provided more than once, separate transactions for each funding adjustments should be recorded.

h. Column 7, Remarks. The initial entry in this column shall be "budget." Succeeding entries shall explain any changes entered in columns 3 or 4.

POTENTIAL/ACTUAL UTILITY CONSUMPTION AND RATE INCREASES/DECREASES REPORT

REPORT SYMBOL: EXEMPT

ACTIVITY UIC: _____ PURCHASED UTILITY: ELECTRIC

ACTIVITY NAME: _____

DATE	NATURE OF CHANGE ACTUAL = A POTENTIAL = P CONSUMPTION = C RATE = R	CONSUMPTION (kWh, Gals, FT³, THERMS, ETC.)	RATE PER UNIT COST-UNIT OF CONSUMPTION	INCREASE IN COST FOR EFFECTIVE FY PRICE (CODE)	TOTAL COST (SMIC)	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)
BUDGET 10-1-0_	—	1,000,000 kWh	$ .04/kWh	—	$500	BUDGET
10-30-8_	PC	1,100,000 kWh	$ .04/kWh	$ 40 FOR FISCAL YEAR	$580	BUILDING #4 COMPLEX FACILITY BDG 8-30-8_
11-30-8_	AR	1,100,000 kWh	$ .04/kWh	$ 350 FOR FISCAL YEAR	$880	SEE ATTACHED REVISED RATE SCHEDULE DATED 7-30-8_
1-30-8_	PR	1,100,000 kWh	$ .05/kWh	$ 44 FOR 8 MONTHS	$924	7.81% INCREASE DUE 1-31-8_ PER NEWSPAPER ARTICLE/BILLING ATTACHED
3-31-8_	AR	1,100,000 kWh	$ .03/kWh	$ 18 FOR 8 MONTHS	$942	INCREASE LESS THAN PREVIOUSLY INDICATED PER ATTACHED RATE SCHEDULE
5-30-8_	AC	1,050,000 kWh	$ .03/kWh	$ 15 FOR FY	$957	CONSUMPTION LESS THAN PREVIOUSLY ESTIMATED
8-22-8_	—	—	—	—	$408	ADDITIONAL FUNDS PROVIDED AT MID-YEAR REVIEW
9-30-8_	—	—	—	—	$495	FUNDS OBLIGATED FOR PURCHASED UTILITY DURING FISCAL YEAR

Figure 2-7.--Potential/Actual Utility Consumption and Rate Increases/Decreases Report (EXEMPT).

Potential/Actual Utility Consumption and Rate Increases/Decreases Report (EXEMPT).

CHAPTER 2

ORGANIZATION

SECTION 6: EMERGENCIES

>2600. UTILITIES SYSTEMS VULNERABILITY

1. Purpose. Identify points of utility and energy systems vulnerability, assess the impact upon your mission, and develop remedial action plans to remove unacceptable energy security risks.

2. Background

a. Experience gained as a result of disasters, including the Loma Prieta earthquake and Hurricane Hugo in 1989, have confirmed the importance of utilities systems to mission accomplishment and have pointed out why utility systems vulnerability has become a high priority in the DoD. Commanders must know the vulnerability of their missions and facilities to energy disruptions and the risk of such disruptions, whether the energy source is internal or external to the command. It is essential to eliminate critical energy support vulnerabiities to prevent the disruption of utilities services to key facilities caused by either natural disasters or terrorists' acts.

b. DoD 4170.10 identifies vulnerability assessments as a required action to meet operational mission support requirements through maintenance of energy security. Individual services and agencies are tasked to initiate a facilities energy (utilities) vulnerability program to evaluate the need for action to decrease to an acceptable level the probability of mission impact of energy (utility) source disruption. Vulnerability assessments, energy emergency preparedness and operations plans, and remedial action plans are required to comply with DoD guidance. The vulnerability assessment should be reviewed for currency annually and do the following:

(1) Identify any missions degraded and to what extent.

(2) Define levels of utilities needed to satisfy critical mission requirements.

(3) Identify time delays in carrying out tasks during periods of utilities systems disruptions.

(4) Identify effects disruption may have on the delivery of goods and services to other non-installation commands.

(5) Identify possible corrective measures.

3. Action. Refer to appendix H for implementing instructions.

2601. MOBILE UTILITIES SUPPORT EQUIPMENT (MUSE)

1. Policy. The MUSE program provides portable utilities equipment modules for short-term support to shore facility systems and to Navy and Marine Corps contingency or emergency operations.

2. Criteria. The following specific areas will be supported:

a. Unforeseen shore utilities requirements resulting from emergencies, change in planning or programming, or temporary overloads until requirements can be satisfied by normal programming.

b. Requirements in support of the Cold Iron Program.

c. Replace installed utilities equipment which is out of service for either planned maintenance or overhaul action.

d. Support expeditionary military operational requirements.

e. Support requirements as directed by higher authority.

The program is not intended to provide permanent shore utilities services or to permanently augment or substitute for existing systems. Equipment is designed for mobility and rapid connection which renders MUSE less efficient than comparable fixed systems and therefore dictates use of MUSE solely on an interim basis. MUSE shall not be used to fulfill a requirement for which a MILCON project has been submitted and denied except upon receipt of specific authority from NAVFACENGCOM.

3. Program Management. The MUSE program assigns program manager responsibilities to NAVFACENGCOM. These responsibilities are listed in appendix I. Operational and technical functions assigned to the Commanding Officer (CO), Naval Energy and Environmental Support Activity (CO NEESA), Port Hueneme are also included in appendix I as are the engineering functions of the EFD's and the contractual tasks of the OIC NAVFACENGCOM Contracts, Port Hueneme.

4. MUSE Inventory. The current MUSE inventory includes, but is not limited to, the following items:

a. Mobile electric power plants (diesel and gas turbine) with a minimum capacity of 750 kW.

b. Mobile steam plants with a minimum capacity of 5,000 lb/h.

c. Mobile electric substations with a minimum capacity of 1,500 kVA.

d. Specific information on citing, fuel consumption, maintenance requirements, and other operational considerations for inventory items is available from the CO NEESA.

5. Requesting Instructions

a. General. Requesting activities will determine actual need and degree of emergency that justifies deployment of MUSE units.

b. Data Required. All requests should include the following information. Message requests shall provide the information in an abbreviated format:

(1) Requesting activity.

(2) Description of the utilities deficiency, and action planned to resolve that deficiency and to relieve MUSE.

(3) Data identifying the capacity and characteristic of MUSE required, and the maximum, average, and minimum demand anticipated to be placed on the equipment.

(4) Required delivery date (day, month, and year) and approximate length of time MUSE will be required.

(5) Priority designator. When conditions dictate air shipment, the request should so state.

(6) Exact shipping data (address) of requesting activity, including unit identification code where applicable, and a designated recipient.

(7) Unusual conditions or requirements that exist; i.e., climatic conditions, site space constraints, special transport requirements (bridge or highway), handling equipment, availability of trained operators, etc.

(8) Name and telephone number of an individual at the requesting activity to act as point of contact for MUSE matters.

(9) Economic justification including a comparative evaluation of alternative means considered to meet the utilities dificiency.

c. Requesting Procedures. MUSE will be deployed to Marine Corps activities upon receipt of a valid request meeting the requirements outlined. Requests shall be forwarded for approval

to the CO NEESA via the cognizant EFD. The EFD will review and validate the MUSE request and will provide necessary assistance as described in appendix I. HQMC will endorse and validate MUSE requests and will include a plan of action and milestones (POA&M) to solve the utility deficiency. The POA&M shall identify the project(s) correcting the deficiency and provide a completion date, estimated cost, and action taken to accomodate the project(s) with MCON, Operation and Maintenance, Navy (O&MN), or other procurement, Navy (OPN) funded programs. In the case of emergency requirements, the CO NEESA should be contacted directly with a request, providing the above information within 30 days.

6. Assignment and Deployment. Upon approvals as set forth in paragraph 5, MUSE will be deployed to the requesting activity. Deployment will be for either a definite period as stated in the approved request or 36 months, whichever is less. Equipment will be inspected before shipment to ensure effective, efficient, and safe operations and completeness of equipment support parts, inventory lists, manuals containing operating and maintenance instructions, and parts catalogues. Under no circumstances will equipment that does not safely operate at rated capacity be released to an activity. Method of transportation will be via the most economical mode, due consideration being given the urgency of need. Responsibilities of using activities during deployment periods are set forth in appendix I. CO NEESA will forward a deployment agreement, also included in appendix I, for execution. Equipment will be inspected upon installation as prescribed in the "MUSE Deployment and Maintenance Inspection Plan" located in appendix I.

7. Inspections. CO NEESA will conduct on-site inspections of installed equipment and will review the operating procedures periodically to assure that equipment is being properly maintained and operated. CO NEESA will provide the using activity with a written report of the results of inspections and any recommendations for corrective action. A copy will be forwarded to the cognizant EFD and HQMC for action as required. When indicated by the inspection report, the using activity may be requested to provide progress reports responsive to noted deficiencies as prescribed in the MUSE Deployment and Maintenance Inspection Plan.

8. Deployment Extension. Requests by using activities to extend deployment shall be submitted, with full justification to the office approving the initial deployment per paragraph 2601.5, as soon as the requirement for extension is known. HQMC endorsement of deployment extensions shall indicate the project priority for correcting the deficiency within a finite period. Final review and approval of extensions which will result in a total deployment period of more than 36 months but not more than

72 months will be made by NAVFACENGCOM (NAVFAC 111). Final review and approval of extensions, which will result in a total deployment period of more than 72 months, will be made by the Chief of Naval Operations. CO NEESA will forward an amended deployment agreement to the cognizant EFD.

9. Termination. Approximately 90 days before expiration of the approved deployment period, CO NEESA will advise the using activity of: the termination date, the need for a termination inspection as prescribed in the "MUSE Deployment and Maintenance Inspection Plan," and an agenda. Refer to appendix I regarding funding responsibilities of using activities at deployment termination.

10. Emergency Deployment. All deployed MUSE are subject to redeployment on short notice to meet more urgent requirements. Deployed MUSE shall be maintained in redeployable condition, and installed in a manner that will facilitate rapid disconnection. Instructions, manuals, and equipment support parts will be kept current and fully stocked to accompany redeploying equipment.

11. Funding Responsibilities. Specific responsibilities are reiterated in the documents contained in appendix I.

2602. ENERGY/UTILITY CONTINGENCY PLANS

1. Background/Purpose. The 1973 oil embargo, the 1976 through 1977 natural gas shortages, and the 1977 through 1978 coal-induced electric power shortages all caused serious local disruptions. The potential for periodic domestic energy curtailments and subsequent disruption of the operations of the Marine Corps is increasing. Therefore, it is vital that plans for emergency situations be developed. An energy curtailment contingency plan for energy source selection shall be developed and regularly exercised.

2. Criteria. Contingency plans must minimize reaction times to changes in resource requirements before depletion of operating stock which would require the use of reserves. Local contingency plans and knowledge of available policies and procedures are necessaray to minimize the impact of future energy supply disruptions. Preparation for these contingencies requires estimates of the amounts of fuel and electricity consumed by each building at an activity, so necessary reduction actions can be determined quantitatively before last-minute interruption.

a. Paragraph 2205 of this Manual and DoDInst 4140.25, "Management of Bulk Petroleum Products, Facilities and Services," direct that all oil storage capability, based on the coldest 30-day requirement, and that all natural gas-fired plants

with a capacity of 5 Mbtu per hour and greater be modified to have the capability to burn fuel oil. The Navy is identifying, constructing, or modifying facilities to comply with these storage and alternate fuel requirements within available MILCON funds.

b. Casualty and load shedding plans for emergencies caused by shortages and electric power cutbacks shall be developed at the installation level.

c. Because the disruption of bulk petroleum deliveries continues to be a real threat, Marine Corps activities must continually be aware of the provisions of Title 15 U.S.C. 2002 concerning fuel allocation priorities in the event petroleum deliveries are curtailed.

d. The following Navy guidelines were issued in the event of energy curtailments:

(1) Expedite modification of Navy- and Government-Owned Contractor Operator (GOCO) natural gas burning plants to have a dual capability of burning fuel oil and natural gas.

(2) Expedite construction and load out of 30-day minimum storage capability, computed on the basis of the coldest 30-day requirement, for all Navy and GOCO's oil-fired plants.

(3) Identify all major contractors and GOCO's who face potential curtailment of natural gas or who face overall energy shortages during the winter heating season.

(4) Advise GOCO's and Navy contractors of actions to take with respect to projected shortages or, in the event of actual natural gas shortages with respect to securing additional supplies. Actions in order of priority include the following:

(a) Obtain an alternate energy source.

(b) Appeal to the local natural gas distributor and to the State regulatory body for relief.

(c) Purchase intrastate natural gas directly from the producer under provisions of Federal Power Commission (FPC) Order No. 533.

(d) Appeal to the FPC for "extraordinary relief" under provisions of FPC Order No. 467-C.

(e) Invoke the Defense Production Act (DPA) of 1950.

The Emergency Petroleum Allocation Act (EPAA) authorizes the Department of Energy (DOE) to allocate petroleum products such as butane, propane, commercial jet fuel, and motor gasoline. All other petroleum products have been decontrolled and cannot be obtained under the EPAA. For energy resources other than natural gas and petroleum, regulatory responsibility is generally diffused and indefinite for peacetime domestic emergencies.

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

CHAPTER 3

PROGRAMS

CHAPTER 3

>Ch 3

PROGRAMS

SECTION 1: INSPECTIONS

3100. DEFINITION. Facilities inspections are the primary generators of maintenance and repair of real property work. Inspections monitor current programs, identify deficiencies, and initiate corrective action to keep real property at, or bring it up to, the desired activity standard. General guidance for inspection and maintenance of all real property including utilities, is contained in MCO P11000.7. Establishing and executing a comprehensive maintenance program is essential to ensure safe, reliable, and efficient utilities operations. The development of the utilities portion of the long-range maintenance plan and all work performed in connection with maintenance and inspection of utilities should be coordinated with the utilities engineer. Energy conservation shall be included as a specific item to be examined during local command inspections. A well-designed inspection system should contain four distinct inspection programs.

1. Control Inspection. Control inspections on all utilities systems are conducted by operations division personnel at least annually to detect deficiencies in early stages of development.

2. Preventive Maintenance Inspection. Preventive maintenance consists of the inspection, lubrication, minor adjustment, and minor repair of utilities systems. Within the plant, such maintenance should be accomplished by qualified utilities division personnel using guidance contained in NAVFAC MO-322 (Inspection for Maintenance of Public Works and Public Utilities), volumes 1 and 2. Accurate logs shall be maintained showing maintenance performed, date, and attendant's name. Preventative maintenance and repair of distribution systems should be accomplished by repair division personnel after coordination with the utilities engineer.

3. Cyclic Maintenance Inspection. This is a scheduled inspection and immediate repair of recurring minor structural, electrical, or mechanical items in high-use structures where such efforts are economical. They are limited to that which can be accomplished with simple hand tools and within 30 minutes per task.

4. Operator Inspection. This is the daily or periodic examination and minor adjustment of equipment and systems to which a specific operator is assigned.

3101. BOILERS AND UNFIRED PRESSURE VESSEL INSPECTION

1. General. Because of their threat to safety when defective, boilers and unfired pressure vessels require inspection by specially trained and certified inspectors. Activities staffed with such certified inspectors should conduct in-house inspections by specific job orders. Activities not having such specialists may request the services of the cognizant EFD or may contract for the inspections required by and following chapter 3, section 2, of NAVFAC MO-322. Refer to MCO P11000.7 for additional information. This guidance applies to the Marine Corps Reserve.

2. Information

a. Boilers and unfired pressure vessels are potentially dangerous systems. Boilers, especially, are costly items which require large annual expenditures for operation and maintenance. Personnel responsible for boiler and pressure vessel inspection must be thoroughly trained and experienced, and have the character and authority to withhold inspection certificates when required. The activity commander shall ensure all deficiencies found during the inspection process are promptly corrected.

b. The following are satisfactory methods for accomplishing inspections on boiler/unfired pressure vessels. The method selected by a particular activity shall be the method having the least annual cost.

(1) Locally administered contract.

(2) EFD-administered contract.

(3) Certified inspectors from a nearby Navy or Marine Corps activity.

(4) Activity inspectors. Activity personnel may become certified boiler inspectors by meeting the experience and training requirements listed.

(a) Experience. Three years experience is required in boiler construction, repair, operation, or inspection.

(b) Training. Suggest that prior to taking the EFD certification test, candidates should have taken and passed NAVFACENGCOM Technical Training Center (NTTC) Correspondence Course P-184 (Boiler Design Inspection). Candidates may take this course by applying directly to NTTC, Navy Public Works Center, Norfolk, VA 23511. All required training taken to become a certified boiler inspector will take place during working hours unless otherwise directed by the head of the facilities maintenance division.

(c) Certification. The activity having candidate inspectors shall request the EFD to administer a certification test. Candidates must pass the test with a grade of 70 or above to become certified.

c. Inspection Reports and Certificates. Except where specifically requested by the EFD or NAVFACENGCOM headquarters, activities are not required to send copies of inspection reports to NAVFACENGCOM. These inspection reports are exempt from reports control.

(1) Distribution of reports will be as follows:

(a) Data Record Sheet-Boilers (form NAVFAC 9-11014/40). Activity retains original and forwards 1 copy to the CMC (LFF) upon initial inspection of a new boiler (or pressure vessel).

(b) Inspection Report-Boilers (form NAVFAC 9-11014/41). Regular Marine Corps activities and Reserve training centers retain original form after completion of inspection. Copies are not required by the CMC.

(c) Inspection Certificate for Boiler - Unfired Pressure Vessel (form NAVFAC 9-11014/32). Activity retains the original and displays it on the boiler or in the boiler room. Copies are not required by the CMC.

(2) Required Forms and Certificates. Required forms and certificates are available from the Commanding Officer, Naval Publication and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

(3) Withheld Certificates. Whenever a certificate is withheld, the inspector shall advise the activity commander in writing with a copy to the CMC (LFF). No boiler may operate without a valid inspection certificate.

3102. UTILITY SYSTEM INSPECTIONS. The following checklist can be used as a guide in evaluating your progress toward meeting energy management goals and objectives.

1. Does the installation have a steam trap maintenance program? Does the installation effectively execute its steam trap maintenance program? (See paragraph 4206.7.)

2. Does the treated potable water meet applicable Federal, State, and local requirements? (See paragraph 4500.)

3. Does the treated sewage meet applicable Federal, State, and local requirements? (See paragraph 4502.)

4. Does the backflow prevention program meet State and/or local requirements? (See paragraph 4505.)

5. Has the installation taken actions (if necessary) to adjust the power factor? (See paragraph 4303.8.)

6. Has the installation been able to, or taken actions to, reduce peak electrical consumption? (See paragraphs 4302 and 4303.)

7. Are preventive maintenance schedules being met? (See paragraph 2203.4.)

8. Does the installation effectively monitor and/or administer water treatment for boilers? Cooling towers? (See paragraph 4507.)

9. Are safety instructions and emergency procedures posted in the boiler plants? Other applicable utilities plants? (See paragraph 4200.)

10. Are utilities plants fully staffed? (See paragraphs 4200, 4503, and 4504.)

11. Do the utilities plant personnel meet, or hold, the cerification requirements established by the State and regional authorities? (See paragraphs 3101, 4503, and 4504.)

12. Are the UCAR's (NavCompt Form 2127) annually submitted by the established date and properly completed? (See paragraph 2406.2f.)

13. Are the utilities rate increases/decreases reports submitted by the established dates and properly completed? (See paragraphs 2502 and 2503.)

14. Are the figures of merit submitted by the established date and properly completed? (See paragraph 2406.2f.)

>Ch 3 15. Are DUERS reports being properly completed? (See paragraph 5005.)

16. Does the installation annually observe energy awareness week with displays, presentations, and receive command support? (See paragraph 2105.)

17. Does the installation have a current utilities master plan? (See paragraph 2201.)

18. Does the utilities master plan: address current utilities demand verses capacity, address future utilities demand verses capacity, establish requirements to meet future utilities demand? (See paragraph 2201.)

19. Are tasks established by CMC (LFF) to be accomplished via allocated P2 funds being completed? (See paragraph 2103.)

20. Have actions been initiated to address the recommendations or correct noted deficiencies found in Utility System Assessments (USA), Utility Technical Studies (UTS), and other utilities/energy studies? (See paragraph 2204.)

21. Are utilities for mission-essential operations ensured or have projects been initiated (to ensure utility supply)? (See paragraph 2600.)

22. Does reduction in energy consumption meet the Marine Corps DoD established goals based on the FY 1985 baseline? (See paragraph 2202.)

23. Has the installation established a UCAB that establishes and reviews energy and utilities goals and requirements? (See paragraph 2101.)

24. Does the installation have energy/utility contingency plans? (See paragraph 2602.)

CHAPTER 3

PROGRAMS

>Ch 3 SECTION 2: AWARDS

3200. INCENTIVE AWARD PROGRAMS. All units shall encourage energy and water savings suggestions through incentive awards; for example, the selection of applicants for beneficial suggestion awards and letters of commendation and appreciation.

3201. FEDERAL ENERGY AND WATER MANAGEMENT AWARDS

1. Focus. The annual Federal Energy and Water Management Awards to be presented by the Federal Interagency Energy Policy Committee will recognize outstanding achievements in energy efficiency and water conservation within the Federal sector. The following areas of energy efficiency and water conservation are examples of typical projects to be recognized under this program.

a. Improved performance; i.e., increased efficiency and/or reduced consumption of energy or water.

b. New concepts, devices, equipment, or procedures which have been proven in practice.

c. Effective training programs for energy managers, operators, or maintenance personnel.

d. Employee awareness programs.

2. Award. The winners will be presented with a plaque at the annual awards luncheon.

3. Period of Eligibility. The annual awards will recognize achievements accomplished during the previous fiscal year.

4. Eligibility. All civilian and military organizations and their personnel are eligible. Awards will be granted in three categories: Individuals, Small Groups, and Organizations. Double awards (to both individuals and organizations) for the same performance will not be made.

a. Individuals or small informal groups (which do not constitute an organization) who were directly responsible for the achievement of significant energy or water savings or the conduct of a significant energy or water conservation program.

b. Organizations of more than five persons which demonstrate significant reduction in overall energy or water consumption or cost. For example, implementing wise energy management practices; initiating, developing, and implementing particularly effective no-cost, low-cost programs; or improving efficiency as demonstrated by achievement of a significant reduction in consumption of fuel or water.

5. Nomination Procedures

a. Any civilian or military employee may nominate any individual or organization for a Federal Energy Efficiency and Water Award. The nomination shall be endorsed by the nominee's immediate supervisor or the head of the organization's next level.

b. Nominations for awards shall be for quantifiable achievements and shall conform to the annually published guidelines for format and content. They shall also include a 75 to 100 word unclassified summary, suitable for use as an award citation.

c. When submitting more than one nomination, installations shall prioritize the entries in a cover memorandum. If an installation has no nominations to submit, they shall forward a negative response memorandum.

d. The submission deadline, normally in May, the evaluation criteria, the format for nominations and specific addressing requirements will be published annually by the CMC (LFF) Nominations that deviate from the prescribed format are strongly discouraged as they may be rejected.

3202. SECRETARY OF THE NAVY ENERGY CONSERVATION AWARDS PROGRAM

1. Information

a. The U.S. Marine Corps competes for the SECNAV Award in three categories:

(1) Large Marine Corps activities.

(2) Small Marine Corps activities.

(3) Aviation squadrons (Navy and Marine Corps)

b. Each award is given for demonstrating an outstanding energy conservation program/accomplishment during the preceding fiscal year.

c. The winners will be recommended to receive a monetary award which can be applied to projects or programs which will benefit the personnel employed or living at the winning activity. Awards will be approximately $40,000 for the large activity and $30,000 for the small activity. Headquarters Marine Corps will supplement these monetary awards with $55,000 for the large activity winner and $45,000 for the small activity winner.

d. The award winners will be announced by the Secretary of the Navy after June of each year.

2. Evaluation. All Aviation squadron nominations will be evaluated using the criteria included in appendix N. Evaluation of shore activities will be conducted using a comparison matrix in two parts; a qualification section and a quantification portion. The criteria for each of these portions may change from year to year but will always be drawn from the requirements established by this Manual.

a. Qualification. In this portion certain "Go, No Go" criteria will be used to select only the top programs for further evaluation.

b. Quantification. This section consists primarily of quantifiable performance indicators which will be used to determine the top program from those selected in the first portion of the evaluation.

3. Submission

a. Installations. All installations will be evaluated for the SECNAV Award based on their annual submission of the Energy Management Annual Report.

b. Aviation Squadrons

(1) Submissions must be in a narrative format and address the eight sections listed in appendix N. The narrative must be no more than five pages.

(2) Submissions must be received by 1 February of each year for achievements during the previous fiscal year.

(3) Aviation squadron commanders shall submit the original award entry to the CMC (LFF)

(4) Marine Corps aviation squadrons will compete against Navy aviation squadrons. The winner will receive a $20,000 monetary award.

CHAPTER 3

>Ch 3 PROGRAMS

SECTION 3: PERSONNEL DEVELOPMENT

3300. TRAINING COURSES

1. Establish formal and/or informal training programs for those individuals requiring additional training to upgrade skills, qualify for certification, and to provide for career development. Take advantage of existing training programs within the DoD, industry, and other Federal Government agencies. Operating personnel for water and wastewater facilities are encouraged to enroll in short courses and to obtain operator's licenses under certification programs administered by State or regional authorities.

2. Utilities training courses are available through the NTTC, Navy Public Works Center, Norfolk, VA 23511. Courses consist of both home study types and specialized courses presented at manufacturers' plants or other Government installations. Apprentice and mechanic training plans and outlines are also available. The NTTC will bear tuition costs for all courses, except for travel and per diem (when required for specialized courses) which are to be borne by the participating activity. Activities shall use the NTTC's specialized courses to the extent that funds are available and shall encourage employees to participate in home study courses. Activities should address catalog requests directly to the NTTC.

3301. OPERATOR CERTIFICATION

1. Activity commanders shall ensure that personnel responsible for operation of utilities plants (heat, air-conditioning, electrical, water, and sewage) meet or exceed certification requirements established by State or regional authorities. Whenever available, NAVFACENGCOM proficiency levels and certification procedures will be used.

2. Activity commanders shall program under the civilian training program for travel and per diem costs, testing and certification fees, and administrative leave for required testing and certification.

3302. SUPERVISION. Utilities plant operators shall be directed by technically qualified personnel to assure maximum safety and efficiency.

3303. TECHNICAL SOCIETY MEETINGS, SEMINARS, ETC. To aid in increasing and updating the technical knowledge of personnel and to improve the effectiveness of the utilities management program, participation in technical society meetings and engineering/ management seminars is encouraged at all levels of utilities management. Per diem and travel costs shall be programmed for in the annual budget submission.

CHAPTER 3

>Ch 3 PROGRAMS

SECTION 4: UTILITIES CRITERIA

3400. EXISTING UTILITY SYSTEM APPEARANCE. To enhance the activity's visual environment, positive programs to improve the appearance of existing utilities plants and distribution systems will be initiated. Activity commanders shall ensure that utilities plants are clean and orderly, buildings are painted, grounds are attractively landscaped, and distribution lines and equipment are free of corrosion and properly covered and/or painted.

3401. NEW UTILITY SYSTEM APPEARANCE

1. Design Criteria. Citing of utilities shall be per DoD 4270.1-M and associated MIL-HDBK-1190.

2. Equipment Screening. In locating utility items, such as cooling towers, evaporative condensers, pressure-reducing stations, meters, transformers, etc., ensure that these items are located so as not to detract from the overall appearance of the facility, particularly in nonindustrial-type facilities. When necessary, use screening; however, do not lower the efficiency of the equipment because of the screening. Locate cooling towers, evaporative condensers, and air-cooled condensers so as to discharge with the prevailing winds. When adjacent to electrical substations, parking areas, or buildings where overspray may cause damage or be objectional, locate cooling towers and evaporative condensers to the leeward side and equip them with baffles or overspray eliminators.

3402. UTILITIES METERS

1. Purpose. These meters which measure production and distribution of utilities permit performance analyses of production facilities, accurate determination of consumption, efficient management of waste, and effective control of costs. Install meters whenever practicable. Study the feasibility of installing metering devices for every proposed project involving utilities systems.

2. Master Meters. Install one set of master meters at each activity to measure utilities services.

3. Metering of Family Housing. Metering for housing shall be per DoD 4270.1-M and associated MIL-HDBK-1190.

4. Temporary Meters. If it is necessary to determine utilities consumption in barracks, public quarters, or other buildings including nonappropriated fund facilities, the necessary instruments may be installed temporarily.

5. Installation Costs. Meters used to measure utilities services to reimburse customers shall be installed at the expense of the consumer. When a consumer requires temporary service or the installation of a meter is otherwise unwarranted, quantity consumptions shall be estimated by the UCAB. (See paragraph 2406.)

6. Calibration and Maintenance. Calibrate meters as often as needed to ensure accurate data. All meters and utilities system instrumentation shall be properly maintained at all times.

3403. MECHANICAL ROOMS. Make adequate provisions in mechanical rooms to allow for the removal of tubes from boilers, chillers, condensers, and to remove coils and filters from air-handling units for maintenance or replacement. To save room space make full use of knockout panels or doors on outside walls for tube and other equipment removal. Locate equipment to allow adequate access for maintenance and servicing. Arrange piping and valves so they will not prevent personnel movement within the equipment room, and locate all valve for ready accessibility. When necessary, because of the location of valves and headers, furnish catwalks or ladders for operating and servicing the valves. Gages and thermometers shall be of such size, scale, and location as to be easily read by operating personnel.

3404. UTILITY LINES. All valves, balancing dampers, controls, etc., which are required for proper maintenance and operation of the mechanical, plumbing, and electrical systems shall be readily accessible. When runs are above corridor ceilings or in pipe cases or trenches, access panels shall be installed, as necessary, for proper maintenance and operation of the system.

3405. ENERGY MONITORING AND CONTROL SYSTEMS. Consider providing energy monitoring and control systems for individual buildings and/or installation-wide utilities systems, where economically justified. Analyze all feasible control systems to determine the comparative savings in manpower, utilities costs, transportation requirements, and operating costs.

3406. LIFE-CYCLE COSTING. Select the type of plant, energy source, materials, etc., not solely upon low initial costs but upon lowest total costs (initial, operation, and maintenance) for the expected life of the item. The maintenance officer, public works officer, utilities engineer, and other utilities managers shall be guided by this principle in all phases of utilities operations. Appendix F and paragraph 2204.3c, provides detailed guidance.

3407. FACILITY PROJECT CRITERIA

1. General Information. Modify existing facilities to conserve energy by accomplishing energy conservation projects. The utilities engineer shall continuously review the technical features of building, equipment, and utilities plants and systems to determine if utilities cost savings may result from alterations thereto.

2. Requirements. Whenever the energy savings in millions of Btu's divided by the project cost in thousands of dollars is greater than the ratio of 20:1, take the following action:

a. Local Approval Authority. Activity commanders shall, to the maximum extent feasible, plan for and accomplish energy conservation projects within the funds provided in the annual operating budget.

b. Headquarters Approval Authority. Energy conservation projects exceeding the local commanders approval authority shall be submitted as part of the annual facilities projects program per MCO P11000.5. An economic analysis shall accompany the submission and may be used as justification of project accomplishment. Refer to chapter 2, paragraphs 2102 and 2103 of this Manual.

3. Examples. Examples of facilities projects involving utilities conservation are listed below.

a. Additional insulation.

b. Reflective roof coatings.

c. Solar shading and screening devices.

d. Automatic controls.

e. Night and weekend temperature setback devices.

f. Air-to-air rotary heat exchangers.

g. Capacitors to improve the power factor.

h. Storm windows.

i. Single building controllers.

j. Steam trap replacement.

k. Insulation of steam lines.

CHAPTER 3

>Ch 3 PROGRAMS

>3500. GENERAL. The Energy Conservation Policy Act, Executive Order 12902 and DEPPM's 92-1 and 91-3 require the military services to use alternative funding methods for energy conservation projects when financially feasible.

>3501. BACKGROUND. Investment in facilities is one of five strategy elements of the Marine Corps Energy Conservation Campaign Plan. Getting resources to make investments needed to meet energy conservation mandates is a challenge for every command. Our estimates show that as much as half of the investment needed to reach energy reduction goals must come from other than appropriated sources.

>3502. DEFINITION

1. Energy Savings Performance Contract (ESPC). An ESPC, covered by DEPPM 92-1, is a contract in which the contractor may identify, finance, design, implement, operate, maintain, and own infrastructure improvements that improve energy performance. These contracts are paid for through the utility bills as a percentage of the energy savings generated.

a. ESPC may be executed as stand alone contracts, area-wide contracts, or technology specific contracts through various DoD and Federal contracting sources. They may also be executed on a sole source basis to an energy services company (ESCO) through a regulated utility serving the installation as long as the utility can show the ESCO was competitively selected.

b. ESPC may be executed through the Navy ESPC Team (Naval Facilities Engineering Service Center (NFESC) and Naval Facilities Engineering Command Contracts Office (NAVFACCO) at Port Hueneme, California), the U.S. Army Corps of Engineers Engineering Services Center (USACOE ESC) Huntsville, Alabama, or by using available Army or Department of Energy area-wide delivery order contracts.

2. Demand Side Management (DSM). DSM, covered by DEPPM 91-3, is a sole source modification to the existing utilities contract in which the contractor may identify, finance, design, and implement projects that improve energy improvements. These

contracts are paid for as a fixed addition to the existing utility bills.

a. DSM may be executed through utility contract modifications or electing to participate in existing DSM provisions of area-wide utility contracts in which the installation may be participating.

b. Servicing EFD/EFA/PWC's have information on access to DSM services and capability to execute DSM efforts.

>3503. POLICY. Alternative financing mechanisms will be used when they can effectively address installation facility energy conserving investment needs.

>3504. RESPONSIBILITIES

1. CMC (LFF)

a. Will fund ESPC and/or DSM contract development from energy program funding when necessary and funds are available.

b. Will provide policy, procedure, and technical information and updates to field activities in order to foster timely implementation of these programs.

c. Will support training on issues and procedures pertaining to ESPC and DSM implementation and execution as funds are available.

d. Will coordinate notification of appropriate authorizing and appropriating committees of Congress when ESPC unfunded contingent liability exceeds $750,000 as required by 10 CFR Part 436.34.

2. Installation Commander

a. Will determine whether ESPC or DSM can be effectively implemented to provide installation facility energy investments needed to meet installation energy reduction goals as per the installation Long-Range Utilities and Energy Plan.

b. Will implement ESPC and/or DSM when they can effectively address installation facility energy conserving investment needs.

c. Will support ESPO and/or DSM implementation as needed. Will provide information (maps, facility plans1 operating schedules, etc.), facility access and other support as necessary and agreed to under a Memorandum of Agreement or similar vehicle for designating roles and responsibilities for all parties taking part in executing the DSM or ESPC.

d. Will fund yearly contract management costs. Funds may come from utility dollar savings realized as a result of installed facility energy conservation measures.

e. Will ensure trained individuals designated to perform analysis and make recommendations concerning ESPC and/or DSM implementation are trained in relevant areas. As a minimum, individuals must understand how ESPC and DSM work, basic financing concepts associated with these financing methods, facility energy conservation opportunity identification and execution methods. Training is available through HQMC sponsored seminars and workshops, Department of Energy classes sponsored by the Federal Energy Management Program, or various related publications.

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

CHAPTER 4

CONSERVATION

CHAPTER 4

CONSERVATION

SECTION 1: GENERAL

4100. GENERAL CONSERVATION. Energy cost have continued to rise and are expected to continue to rise significantly in the future. Since Marine Corps operations and training are inextricably linked to the availability and use of liquid hydrocarbon fuels in an atmosphere of ever decreasing availability and increasing cost, an active, aggressive, and dedicated Marine Corps Energy Conservation Program is essential to ensure a force in readiness. Significant reductions can be made through conservation measures without impinging on operational readiness or the health and welfare of our Marines and their families merely by ensuring that the maximum efficient use is made of all energy resources by all personnel. Leadership, command interest, initiative, example, supervision, and discipline are needed to attain the goals of the Marine Corps Energy Conservation Program. The following establishes policy and provides guidance for each Marine Corps utility. It is the policy of the Marine Corps to support and implement this program, which applies to all Marine Corps operating forces and installations. Utilities conservation is an integral part of energy conservation.

CHAPTER 4

CONSERVATION

SECTION 2: CENTRAL HEATING EQUIPMENT AND SYSTEMS

4200. OPERATION AND MAINTENANCE MANUALS. Activities should use the following publications as guides for O&M personnel:

1. NAVFAC MO-114 (Building Maintenance - Plumbing, Heating, and Ventilation).

2. NAVFAC MO-205 (Central Heating and Steam Electric Generating Plants). This publication is comprised of the following:

a. Volume 1 (Fuels).

b. Volume 2 (Steam Generators).

c. Volume 3 (Draft Fans and Chimneys, Feedwater, Control Equipment, and Instruments).

d. Volume 4 (Steam Turbines, Electrical Equipment, and Auxiliary Equipment).

e. Volume 5 (Steam Power Plant Fundamentals).

3. NAVFAC MO-209 (Maintenance of Steam, Hot Water, and Compressed Air Distribution Systems).

4201. DESIGN CRITERIA. General heating system policy and design criteria, including building insulation and heating controls requirements shall be per DoD 4270.1-M, chapter 11 and associated MIL-HDBK-1190. (See DoD 4270.1-M,chapter 13 and associated MIL-HDBK-1190 for family housing criteria.)

4202. MINIMUM OPERATOR ATTENDANCE FOR BOILERS UTILIZING FULLY AUTOMATIC AND SEMIAUTOMATIC CONTROLS

1. The following definitions apply:

a. Fully Automatic Boiler. A boiler fitted with controls which will automatically do the following:

(1) Regulate and maintain the proper water level within the boiler.

(2) Regulate the rate of combustion in response to heat output requirements and/or cutoff the fuel supply when a predetermined condition is reached.

(3) Cut off the fuel supply in the event of low water, loss of ignition, or other predetermined emergency conditions.

(4) Turn on the fuel supply and start combustion when additional heating is required.

(5) Lock-out on safety in case of failure to light-off.

(6) Lock-out on safety in case of loss of ignition.

(7) Provide pilot proving before opening the main fuel valve on boilers with gas or oil pilots.

(8) Prevent an attempt to light-off if the gas pressure is below a predetermined minimum on boilers with a gas pilot.

(9) Provide preignition purging and postpurging on shutdown for boilers with heat input in excess of 750,000 Btu/h.

b. Semiautomatic Boiler. A boiler fitted with controls so that:

(1) The water level within the boiler is regulated automatically.

(2) Combustion is regulated automatically by the demand for heat.

(3) Fuel supply is automatically cut off in the event of low water, loss of ignition, or other predetermined emergency conditions.

(4) Startup is not automatic.

In addition, semiautomatic boilers shall have pilot ignition with pilot proving devices. Each burner of a multiburner semiautomatic boiler shall be manually activated to restart following any shutdown.

c. Central Alarm System. An automatic system which indicates, by sounding an alarm, lighting a light, etc., whenever abnormal conditions exist in the boiler plant or system. Central alarm systems must include signals for flame failure, low water, and excessive or insufficient pressure or temperature, and may include signals for low fuel pressure and temperature and other

pertinent items which directly affect the combustion process or safety of operations.

d. Central Monitoring System. A central alarm system that is remotely monitored.

2. All boiler plants will receive constant or periodic attendance to ensure safe, efficient operation and to accomplish preventive maintenance.

3. Unless specifically waived by the appropriate EFD of the NAVFACENGCOM:

a. Boilers without fully automatic controls shall have an operator in continuous attendance whenever the boilers are in operation.

b. Boilers (oil-or gas-fired) using fully automatic controls shall have minimum attendance requirements as shown in figure 4-1. For economic reasons, only the one out-of-tolerance alarm signal should be transmitted to the central monitoring point. More sophisticated central monitoring systems should be adequately justified by an engineering study.

c. Continuously manned plants (with either fully automatic or semiautomatic controls) shall have minimum staffing as shown in figure 4-2.

d. The minimum attendance/staffing requirements specified in the preceding should assure satisfactory operation. However, reliability of equipment, qualifications of personnel, installation of alarm systems, and seasonal loading affect these minimum requirements. Accordingly, more frequent attendance and additional staffing may be required in certain cases. Finally, with the conversion to coal burning plants at many activities the manning requirements shown in figure 4-2 should be increased to account for the additional work associated with operating, maintaining, and cleaning air pollution devices such as electrostatic precipitators and additional auxiliary equipments.

4. To ensure that minimum attendance functions are fully covered, a set of standard operating procedures (including safety practices) shall be established and posted at each boiler plant. For boilers not requiring continuous attendance, operational visits shall be of sufficient duration to periodically check automatic controls and safety devices and to perform preventive maintenance on equipment, using the guidance contained in the NAVFAC MO-205. In addition, a log shall be kept in the boiler-room. This log shall contain such information as the name of the attendant, date, time, observations, maintenance performed, etc.

5. When existing boilers have been in service with fully automatic or semiautomatic controls not meeting the definitions contained in, paragraph 4202.4, activities shall request the local EFD of the NAVFACENGCOM to evaluate the feasibility of modifying controls for conformance (except that the addition of flame safeguard controls is mandatory for all semiautomatic boilers). However, in no case shall a steam boiler be operated unattended without low water or loss-of-ignition cutoff devices.

4203. FUEL SELECTION AND CONVERSION CRITERIA. Activities shall adhere to the guidance contained in chapter 11 of DoD 4270.1-M and associated MIL-HDBK-1190 and paragraph 2204.

4204 LUBRICATING OIL RECYCLING AND REUSE POLICY

1. Information

a. Marine Corps and other DoD activities require an adequate supply of various types and grades of lubricating oils to operate industrial equipment, vehicles, and aircraft.

b. The most energy conservative and environmentally acceptable disposal of used lubricating oils is re-refining and reuse. As an alternative, used lubricating oils have been burned in activity heat plants as a fuel or fuel supplement. The Environmental Protection Agency (EPA) classified used lubricating oil as a hazardous waste thereby complicating the burning of used lubricating oil.

c. To promote the overall objective of using used lubricating oil as an asset rather than as a waste product, the DoD has authorized that net proceeds from the sale of such oil may be used at the discretion of activity commanders to accomplish special projects related to environmental improvement and/or energy conservation.

2. Action. Activity commanders shall:

a. Discontinue all current used lubricating oil disposal practices which are not environmentally acceptable, including weed control, insect control, road dust control, open pit burning, dumping into landfills, etc.

b. Maximize the recovery and collection of used lubricating oil to include:

(1) Identifying sources not being recovered and institute new procedures to recover this additional oil.

(2) Encouraging voluntary participation of military and civilian employees, who change the crankcase oil in their personal vehicles, to deliver the recovered oil to a Marine Corps collection point. Cooperative programs with local business, civic, and governmental organizations might also be considered.

c. Use the services of the Defense Utilization and Marketing Offices to accomplish the sale of recovered lubricating oil for the purpose of re-refining. (DoD 4160.21-M, Defense Disposal Manual applies.)

d. Burn the used lubricating oil as a fuel in boilers, if no reasonable arrangements can be made for recovery by refining. In determining reasonableness, economics alone shall not be considered as sufficient justification for burning used lubricating oil; environmental effects and conservation shall also be considered.

e. Investigate ways to reduce the generation of used lubricating oil through good preventive maintenance, optimizing oil drain intervals, etc.

f. Accomplish locally desired special projects related to environmental improvement and/or energy conservation using net proceeds from the sale of used lubricating oils.

g. Keep accurate records for review by inspecting officials, regarding the following:

(1) Volume of used lubricating oil generated.

(2) Volume of used lubricating oil recovered for sale and volume recovered for burning.

(3) Revenue from sale.

(4) Expenditures to administer used lubricating oil recycling program.

(5) Net proceeds available for special environmental and energy projects.

3. Reserve Applicability. This policy applies to the Marine Corps Reserve.

4205. POLLUTION ABATEMENT AND FUEL CONSERVATION AIDS

1. Policy. Any new product, method, or treatment in the construction, operation, and maintenance of heating or power plants shall be evaluated, prior to use, by the appropriate EFD

of the NAVFACENGCOM. Activities shall forward a request for such evaluation to the appropriate EFD, including information obtained from the manufacturer or sponsor as follows:

a. A statement defining the intended purpose and functions of the aid.

b. A complete description of the aid, including information on its application, methods of operation, and the environmental conditions under which it is designed to function.

c. Detailed results of a research and testing program conducted by an independent agency. Tests should be conducted using the procedures defined in the American Society of Mechanical Engineers Power Test Code 4.1, addendums 1 and 2. The abbreviated efficiency test will be sufficient. Additionally, a flue gas analysis by Orsat and flue gas temperature multipoint traverse at the boiler outlet are desirable. Test data should be supplied at no cost to the Marine Corps and no Marine Corps-owned equipment should be used to collect the test data.

Activities shall notify the CMC (LFF) whenever such products or methods are approved for use by the EFD. The CMC will then publicize these worthwhile innovations and encourage their use at other Marine Corps activities.

2. Commercial Aids. Activities are frequently requested by industry to use various types of fuel additives and fuel savings devices to aid in pollution abatement and/or to increase O&M savings. The NAVFACENGCOM has determined that the majority of these problems can be solved by implementing the correct O&M procedures instead of the use of such aids.

4206. CONSERVATION CHECKLIST FOR HEATING (INCLUDING FUELS)

1. Eliminate the use of electric resistance heating wherever possible.

2. Install area shutoff valves and secure appropriate sections of heat distribution piping during long periods of zero demand.

3. Investigate the feasibility and economy of installing domestic-type heaters to serve buildings in outlying areas and secure steam lines to buildings.

4. Heat buildings to the minimum temperature required for comfort and health. Federal Property Management Regulations (41CFR Part 101-20.107) stipulate that heating temperatures shall be maintained at 65ø to 68ø Fahrenheit (F) in living/working

areas (exclusive of warehouses where temperatures shall be lower). Fifty-five degrees shall be maintained in working areas during nonworking hours. Cooling temperatures shall be set at 78ø to 80øF.

5. Install thermostats to control temperatures. Thermostats in bachelor officers' quarters and barracks with ducted air systems should have return air thermostats located in locked mechanical spaces.

6. Install heat recovery on continuous blowdown systems.

7. Ensure that all equipment is in good operating condition and that all system piping is adequately insulated.

8. Ensure that buildings are weather-stripped, insulation is adequate, and windows and doors fit properly. Make sure that mechanical door closers are in good operating condition.

9. Consider the installation of automatic night and weekend temperature setback controls for all buildings. Night setback controls are especially effective in shops, warehouses, etc.

10. Consider the installation of storm windows and doors, or double-glazing, especially on the inside of buildings.

11. Consider the installation of vestibules at building entrances.

12. Close all window shades, blinds, and curtains at night.

13. Substitute solvent cleaning for steam cleaning. (Solvent must be biodegradable.)

14. Make sure functioning heating controls are properly maintained, and replaced all obsolete heating controls.

15. Wash clothes with cold water whenever feasible.

16. Minimize outside air make-up.

17. Keep the fireplace damper closed tightly when not using the fireplace.

18. Keep building doors closed, consider interlocks which cut off heat when doors are open, and consider radiant heaters in lieu of convection heaters.

19. Install air preheaters, economizers, and other heat-recovery equipment; avoid dumping condensate.

20. Maintain authorized building and domestic hot water temperatures.

21. Use air curtains for entrances with heavy traffic.

22. Cross-connect boiler plants so light loads can be carried by a single boiler and others secured, and do not float a second boiler on the line for backup.

23. Consider reducing steam pressure and high temperature hot water temperatures to reduce line lost.

24. Eliminate humidity control for general office spaces. Requirements for humidity control in special types of spaces or locations shall be handled on a case-by-case basis.

25. Prohibit the operation of portable electric heater blowers, portable electric space heaters (except in those cases where this is the only source of heat available), and electric threshold heaters in Government-owned or -leased spaces.

Plant Classification 1/	Without Central Monitoring	With Central Monitoring 2/
Heating Boiler Plant 3/ 4/		
Up to 360,000 Btu/h	Once/month	At time of service
360,000 - 1,700,000 Btu/h	Once/week	Once/month
1,700,000 - 5,000,000 Btu/h	Once/day	Once/day
5,000,000 - 14,000,000 Btu/h	Once/8 h	Once/12 h
Over 14,000,000 Btu/h		Once/h 5/ Once/4 h
Power Boiler Plant 6/		
Up to 1,400,000 Btu/h	Once/day	Once/week
1,400,000 - 3,500,000 Btu/h	Once/8 h	Once/12 h
3,500,000 - 14,000,000 Btu/h	Once/4 h	Once/8 h
Over 14,000,000 Btu/hr	Once/h 5/	Once/4 h
High-Pressure Power Boiler Plant 7/	Continuous	Continuous

NOTE: For definition of automatic boiler, refer to paragraph 1a.

1/ When two or more boilers are operated on a single plant, minimum attendance shall be based on the capacity of the largest operating boiler or on the capacity of one-half of the sum of all boilers, whichever is greater.

2/ The attendance requirements for plants with central monitoring is based on the minimum time necessary to accomplish preventive maintenance using NAVFAC MO-205 as a guide.

Figure 4-1.--Minimum Attendance for Oil- and Gas-Fired Boilers Using fully Automatic Controls.

3/ A heating boiler is a boiler operated at pressures not exceeding 15 lbs per square inch gage (psig) for steam or at temperatures not exceeding 250øF and pressures not exceeding 160 psig for water.

4/ The minimum attendance specified in the 0 to 900,000 Btu/h range from this group applies only to hot water boilers and to steam boilers connected to a closed circuit gravity return distribution system (no boiler feed pumps). For small boilers, supplying open circuit distribution systems requiring boiler feed pumps, the minimum attendance shall be twice per week.

5/ Boiler plants having capacities between 14,000,000 and 40,000,000 Btu/h (except high-pressure power boilers) meeting the requirements of a fully automatic boiler per MIL-B-17095 or MIL-B-17542 may be operated on an hourly attendance basis. Constant attendance is required when the semiautomatic control sequence is employed.

6/ A power boiler is a boiler operated at a pressure between 15 and 300 psig for steam, or a pressure of more than 160 psig and a temperature betweem 250ø and 400ø F for hot water.

7/ A high-pressure power boiler is a boiler operated at pressures exceeding 300 psig for steam and temperatures exceed 400ø F for water.

Figure 4-1.--Minimum Attendance for Oil- and Gas-Fired Boilers Using Fully Automatic Controls--Continued.

Plant Classification 1/	Fuel 2/	Numbers of Boilers in Plant 1	2	3	4	5	6
		Boilerroom Personnel Per Shift					
14,000,000 Btu/h	Gas	1	1	1	1	1	1
	Oil	1	1	1	1	1	2
25,000,000 Btu/h	Gas	1	1	1	1	1	1
	Oil	1	1	1	1	2	2
40,000,000 Btu/h	Gas	1	1	1	1	1	1
	Oil	1	1	1	2	2	2
60,000,000 Btu/h	Gas	1	1	1	1	1	1
	Oil	1	1	1	2	2	2
80,000,000 Btu/h	Gas	1	1	1	2	2	2
	Oil	1	1	1	2	2	2
100,000,000 Btu/h	Gas	1	1	1	2	2	2
	Oil	1	1	2	2	3	3
125,000,000 Btu/h	Gas	1	1	1	2	2	2
	Oil	1	2	2	3	3	3
150,000,000 Btu/h	Gas	1	1	1	2	2	2
	Oil	2	2	2	3	3	3
220,000,000 Btu/h	Gas	1	1	1	2	2	2
	Oil	2	2	2	3	3	3

NOTE: For the definition of automatic and semiautomatic boilers, refer to paragraphs 4202.1a and b preceding.

1/ See footnote 1 of figure 4-1.

2/ Coal fired plants should use oil manning levels plus paragraph 3d following.

3/ Activities having plants classified above 200,000,000 Btu/h may request the appropriate EFD of the NAVFACENGCOM to determine personnel requirements.

Figure 4-2.--Minimum Staffing for Continually-Manned Boiler Plants Using Automatic or Semiautomatic Controls.

CHAPTER 4

CONSERVATION

SECTION 3: ELECTRICITY AND LIGHTING

4300. OPERATION AND MAINTENANCE MANUALS. Activities should use NAVFAC MO-200 (Electrical Power Distribution Systems - Maintenance) and NAVFAC MO-201 (Operation of Electric Power Distribution Systems) as guides for O&M personnel.

4301. DESIGN CRITERIA. Design requirements for lighting and interior and exterior electrical facilities shall be per DoD 4270.1-M, chapter 12 and associated MIL-HDBK-1190.

4302. REDUCED USE ELECTRIC POWER PLAN. Activities shall prepare a reduced use electrical power plan for use in the event the local power company becomes unable to supply normal power service. This plan will be a part of the energy contingency plan required by paragraph 2602.

4303. CONSERVATION CHECKLIST FOR ELECTRICITY AND LIGHTING

1. Maintain lighting standards by conducting light meter surveys of working areas. As a general rule, during working hours, artificial lighting should be adjusted to no more than 50-ft candles at work stations, 30-ft candles in work areas, and 10-ft candles in nonworking areas. This is not intended to restrict lighting but is required for safety and security.

2. Perform specific surveys to reduce nighttime lighting.

3. Turn off all unnecessary lighting when a room/area is not in use.

4. Maximize task versus general lighting.

5. Replace low with high efficiency lamps. Eliminate incandescents.

6. Minimize decorative and advertising lighting.

7. Install switching to sectional control.

8. Correct the electrical power factor by installing capacitors, synchronous motors, or synchronous condensers.

9. Reduce the outside lighting to the lowest level consistent with safety and security. Eliminate illumination for beautification alone.

10. Exercise standby generating equipment during peak demand periods.

11. Prohibit electric resistance heaters (portable), and replace permanently-installed electric resistance space heaters with another energy source.

12. When purchasing an electrical appliance, be aware of the power consumption. A frost-free refrigerator requires more energy to operate than does a standard model; a side-by-side refrigerator freezer uses more energy than a top and bottom door model; and self-cleaning ovens use large amounts of electricity. Make sure that the room air-conditioners are efficient. A few extra dollars in initial cost could save hundreds in operating costs over the life of the unit. An index of efficiency is found by dividing the unit's Btu/hr rating by its wattage rating. The higher the number, the better.

13. Consider installation of automatic "on and off" devices at appropriate locations; i.e., photocells for hangars.

14. Do not use long-life incandescent lamps without a thorough study of the economics involved. The lumen output per watt of these lamps may be only 75 percent of standard life lamps.

15. Consider a "total" energy system for large buildings; i.e. gas turbine generators used with heat-recovery equipment can produce electricity and steam for heating or absorption of air-conditioning.

16. Apply nonuniform lighting standards to existing systems.

CHAPTER 4

CONSERVATION

SECTION 4: AIR-CONDITIONING, EVAPORATIVE COOLING, DEHUMIDIFICATION, AND MECHANICAL VENTILATION

4400. OPERATION AND MAINTENANCE MANUALS. Activities should use NAVFAC MO-115 (Building Maintenance-Air-Conditioning and Refrigeration) as a guide for O&M personnel. That publication contains information on air-conditioning systems (including evaporative coolers) and refrigeration systems (including domestic types and water coolers).

4401. DESIGN CRITERIA. Activities adhere to the design instructions contained in chapter 10 of DoD 4270.1-M and associated MIL-HDBK-1190.

4402. CAPACITY ESTIMATES. The load factors tabulated below may be used to determine preliminary estimates of air-conditioning capacity requirements. The following factors should be used with discretion and engineering judgment, since climate, internal load, ventilation, shade, building color, etc. influence the actual load:

Application	Floor Area ft(2)/ton 1/
Administration Building (Large)	225 - 275
Administration Building (Small)	325 - 375
Auditoriums	.05 - .07 tons/seat
Bachelor Enlisted Quarters	400 - 500
Bowling Alley	400 - 500
Chapel	.04 - .06 tons/seat
Classrooms	225 - 275
Computer Rooms	50 - 150

1/ Except where noted.

Application	Floor Area ft(2)/ton 1/
Dining Halls	100 - 250
Dispensaries	250 - 300
Enlisted Men's and Officers' Clubs	150 - 200
Hospital Patient Rooms	250 - 300
Married Personnel Quarters	500 - 700
Recreation Rooms	200 - 250
Shops (Precision Equipment)	250 - 300

4403. PROJECT CLASSIFICATION AND CRITERIA. MCO P11000.5 provides guidance and instructions on facilities projects.

1. Construction. Installation of air-conditioning equipment in existing facilities shall be classified as "construction," provided the equipment does not meet the criteria for equipment installation described below.

2. Repair. All projects involving repairs to or replacement of existing air-conditioning equipment shall be classified as "repair," provided:

a. There is no increase in capacity and no additional area involved. It is noted that capacity can be increased to meet current mission requirements like additional office equipment (PC's, etc.) and still be repair project. However, capacity cannot be increased to meet projected (future) requirements.

b. Every effort is made to consolidate existing units or systems to reduce the number of units or systems by replacement with larger units in buildings without a central system.

c. Every effort is made to bring the installation into conformity with the design criteria. When repair by replacement is proposed for a building space adjacent to or near a qualified nonair-conditioned building space, full consideration shall be given to the provision of a single unit for both spaces.

3. Combination Construction and Repair. Projects to replace air-conditioning units which involve an increase in area or

air-conditioning capacity shall be processed as construction or as a combination of construction and repair. Submittals for such projects shall indicate, separately, the cost applicable to the construction and repair portions.

4. Equipment Installation. The term "equipment installation," as defined in MCO P11000.5, applies to the following:

a. Projects to acquire and install air-conditioning in existing facilities when the installation of air-conditioning is necessitated by certain specialized equipment or condition requirements. Such requirements include air-conditioning for the following:

(1) Types of equipment which the manufacturer specifies must be operated in an air-conditioned space.

(2) Prefabricated clean rooms installed in nonair-conditioned spaces or when the central air-conditioning system cannot meet the temperature and humidity to rise beyond reasonable comfort levels.

(3) Reasons of operator comfort in the immediate areas of installed equipment when the operation of the equipment causes the temperature and humidity to rise beyond reasonable comfort levels.

b. Projects for mechanical ventilation systems when necessary for personnel safety or for the proper functioning of the equipment as required by the manfacturer.

4404. CONSERVATION CHECKLIST FOR AIR-CONDITIONING

1. Many conservation techniques for heating apply to air-conditioning. Refer to paragraph 4206.

2. Reduce the outside air supply to a minimum. In classrooms and similar group assembly areas, the restriction or prohibition of smoking will permit significant reductions in the outside air supply with accompanying reductions in the air-conditioning load. Refer to DoD 4270.1-M and associated MIL-HDBK-1190.

3. Shut down air-conditioning to the maximum extent possible on weekends and holidays.

4. Keep filters, condensers, and cooling coils clean to minimize fan horsepower and reduce losses.

5. Ensure that all steam or hot water pipes passing through air-conditioned spaces are properly insulated.

6. Close the blinds, shades, and draperies to reduce the heat load from the sun. Use heat-reflecting glass, plastic film, and solar screening to reduce solar heat gain.

7. Wherever feasible, convert air-conditioning systems to provide an "economy cycle."

8. Install thermostatically-controlled attic exhaust fans.

9. Replace window air-conditioning with a central system when feasible.

10. Consider adjustment of working hours so that workers leave before peak solar gain; encourage the wearing of cool clothing.

11. Install and use shading devices to reduce solar heat gain.

TYPE OF PLANT	AVERAGE CAPACITY (MGD)					
	1	2	5	10	20	35
PRIMARY	4.5-6	6.5-7.5	5-9	10-13	15.5-19	22-27
SECONDARY (INCLUDING TRICKLING FILTER)	6-7	7.5-9.5	9.5-11.5	13-16	19.5-24	28-34
SECONDARY (INCLUDING ACTIVATED SLUDGE)	7-8	9.5-10.5	11.5-13	15-18	23-26	33-38

REF. "ESTIMATING COST AND MANPOWER REQUIREMENTS FOR CONVENTIONAL WASTEWATER TREATMENT FACILITIES EPA REPORT BY BLACK & VEATCH CONSULTANTS.

THE NUMBERS ON THE RIGHT OF THE THREE TREATMENT PROCESSES REPRESENT ESTIMATED MANPOWER REQUIREMENTS. THE GENERAL CONDITION OF THE PLANT, STATE WATER CONTROL BOARD LICENSING/MANNING REQUIREMENTS, VARIATIONS IN WASTEWATER CHARACTERISTICS AND THE QUALIFICATIONS OF THE OPERATORS ARE CRITICAL FACTORS IN DETERMINING ACTUAL STAFFING REQUIREMENTS. FOR SMALLER PLANTS CONTACT THE APPROPRIATE STATE WATER CONTROL BOARD OR WATER RESOURCES BOARD ON MANNING AND LICENSING REQUIREMENTS.

FIGURE 4-3.--RECOMMENDED PLANT MANPOWER REQUIREMENTS.

CHAPTER 4

CONSERVATION

SECTION 5: WATER AND SEWAGE

4500. OPERATION AND MAINTENANCE MANUALS. Activities should use NAVFAC MO-210 (Water Supply Systems) as a guide for O&M personnel.

4501. DESIGN CRITERIA. Design requirement for plumbing systems shall be per DoD 4270.1-M, chapter 11 and associated MIL-HDBK-1190. (See DoD 4270.1-M, chapter 13 and associated MIL-HDBK-1190, also for family housing criteria.)

4502. SEWAGE SYSTEMS. Activities should use NAVFAC MO-212 (Sewage and Industrial Waste Disposal Systems) as a guide for O&M personnel.

4503. MINIMUM OPERATOR ATTENDANCE AND TRAINING FOR WASTEWATER TREATMENT FACILITIES

1. Purpose. The management and operation of wastewater treatment systems at military installations throughout the world is becoming more challenging at all levels of responsibility. Treatment plant managers and operators must become increasingly aware of the tasks and duties necessary to comply with the rules and regulations established by official regulatory agencies. This section is intended as an aid to those managers and operators.

2. Qualified Personnel. Operator training and skills equivalent to those needed for State certification are required of wastewater personnel. In many locations, actual State licenses are required. Membership and participation by personnel in State and national operator associations is desirable and encouraged.

a. The Manager. Administrative and management skills such as planning, budgeting, and supervising maintenance and safety programs are critical areas of good plant operations. Leadership qualities such as the ability to foster good working conditions and incentives while maintaining high standards for the manager and the manager's staff are also important. Leadership by example is a key to being a good manager in a wastewater system. A background in engineering, chemistry, mathematics, and other

sciences coupled with an understanding of manpower administration are ideal qualifications for the manager. To adequately supervise other plant personnel, the manager should have a first-hand experience with the wastewater tasks performed, the equipment used, and the treatment techniques and testing requirements. This indicates that the best supervisor is the person who has experience and knowledge necessary to administer an efficient maintenance program.

b. The Operator. Operators use a combination of scientific knowledge and skillful procedures to operate a treatment plant. Wastewater treatment is a complex process requiring qualified personnel with adequate knowledge and expertise in the wastewater field. More complicated plants can be expected in the future, making plant operations even more difficult. The Federal Water Pollution Control Act Amendments of 1977 established the elimination of all discharges of pollutants into the nation's waters as a major goal for the future. Without skilled and dedicated manpower to operate these plants, this goal cannot be met. Figure 4-3 lists recommended manpower requirements for various wastewater systems by size and type of plant.

3. Operator Training. All military and civilian operators should have training and skills equivalent to State certification requirements in their location or as established by service directives. This training shall be acquired from a number of sources.

a. Apprenticeship under senior employees.

b. Service correspondence courses and training manuals.

c. Military and civilian consultants.

d. State agencies, local and regional technical schools and colleges.

e. WPCF, AWWA, and other operator association courses, slides, tape programs and manuals, and other individualized instruction courses.

f. National Training and Operational Technology Center - EPA at Cincinnati, Ohio.

4504. PERSONNEL AND TRAINING REQUIREMENTS FOR WATER TREATMENT SYSTEMS

1. General. Water treatment facilities vary from ground water supply chlorination to very sophisticated plants that use coagulation, sedimentation, activated carbon, lime-soda softening, filtration, fluoridation, and chlorination. Effective use of manpower in water treatment facilities is important at all times for efficiency and economy, and is essential during periods of national emergency.

2. Personnel Requirements. Water treatment facilities vary so greatly in design, arrangement, and complexity that establishing the number of personnel needed cannot be determined by installation populations or water use.

3. Operator Certification. Most States have statutes that require water treatment plant operators to be properly trained and certified. The Safe Drinking Water Act (SDWA) of 1974 (Public Law 93-523) requires all water treatment plants in States that have primary enforcement responsibility to comply with State statutes regarding water quality standards, operator training, and operator certification.

4. Training Needs. After an operator is certified, continual training is essential to maintain high standards of service, ensure efficient operation, and keep personnel informed of current technical developments.

a. Personnel must be made aware that the health and safety of those residing at the installation depend on the conscientious execution of their duties.

b. Personnel involved in operating the installation's water treatment facilities should periodically attend short courses or water treatment conferences. Such short courses and conferences are sponsored by State health departments, university extension programs, community colleges, and the American Water Works Association (AWWA). In addition, local training programs can be held on the installation with supervisory personnel conducting the training.

4505. BACKFLOW PREVENTION

1. General. The flow of nonpotable water or other liquid into a potable water distribution system is known as backflow. Backflow preventers are used to prevent flow through potential cross-connections. Any connection between a potable water system and a

nonpotable one through which a contaminating flow can occur at numerous places within a water system, and contamination of the potable water system can lead to poor aesthetic quality, wide-spread illness, and even death from toxic substances. Thus, identifying the need for backflow preventers, selecting the proper type of backflow preventer, and the proper operation and maintenance procedures are necessary to ensure the security of the potable water system.

2. Classes of Backflow Prevention Devices. Backflow prevention devices must be installed based on the degree of hazard. These hazards are divided into three classes:

a. Class I - Low Hazard. If a backflow were to occur, the resulting health significance would be limited to minor changes in the esthetics quality, such as taste, odor, or color. The foreign substance must be nontoxic and nonbacterial, with no significant health effect.

b. Class II - Moderate Hazard. If backflow were to occur, the resulting effect on the water supply would be significant changes in esthetics qualities. The foreign substance must be nontoxic to humans.

c. Class III - High Hazard. If a backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans either from a chemical, bacteriological, or radiological standpoint. Effects of these contaminants may result from short-or long-term exposure.

3. Testing and Inspection Schedule. A schedule to test and inspect all backflow prevention devices, including air gaps, is required at each installation. The frequency between tests, inspections, and overhaul of each device must be set up according to the age, condition of each device, and degree of hazard. All devices installed on class III high degree of hazard cross connections must be inspected at least once every 6 months. Over-haul intervals are as recommended by the manufacturer, but must not exceed 5 years. The inspection and test schedules must be placed in the recurring work program. Recommended time intervals for inspection are as follows:

Degree of Hazard	6 Months	12 Months	24 Months
Class I			X
Class II			X
Class III	X		
Class III (Air Gap)		X	

4. Inspection of Cross Connections. A certified backflow inspector must inspect all cross connections to ensure the following:

a. An approved air gap is maintained.

b. Backflow prevention devices are in good condition.

c. Proper installation of newly installed devices and debris resulting from the installation do not interfere with functioning of the device. (This inspection must be done within 1 week after acceptance and 3 months after installation.)

5. Record of Inspection. Local records should be developed to record data on all cross-connections. The location, degree of hazard, description of air gap or protective device installed, and a sketch of the installation must be provided on the form. After each inspection is completed, the date of inspection, test results, observations, corrective action taken, and name of the inspector must be recorded on the appropriate form. For an air gap, the test consists of a visual inspection and "OK" recorded. For other backflow devices the testing is more involved.

6. Maintenance of Backflow Preventers. Maintenance is necessary to keep any mechanical equipment operational. Therefore, any mechanical protective device must be installed where it is accessible for routine inspection, testing, and required maintenance. These devices are mechanical and subject to breakdown, and must be isolated during periods of inspection and repair.

7. Action. Activities should establish and maintain a program which identifies the need, selects the proper type, and properly operates and maintains backflow preventers. Individual State requirements for their testing, inspection, and installation should be determined and used as minimum requirements. If there is only one service line from the potable system and if a water service is required 100 percent of the time, a bypass and a second reduced pressure principle backflow prevention must be installed, to provide an uninterrupted protected water supply.

4506. DOMESTIC HOT WATER TEMPERATURES

1. The actual measured temperature delivered to the user will not exceed 100øF in:

a. All latrines, heads, and toilet facilities without showers or tubs.

b. Buildings with only a few showers and/or showers having a low frequency of use; e.g., duty officer room.

2. The actual measured temperature delivered to the user will not exceed 100øF in:

a. All latrines, heads, and toilet facilities with showers or tubs.

b. In buildings (e.g., bachelor officers' quarters and bachelor enlisted quarters) where there is both heavy and frequent use of the bathing facilities and there is a common hot water supply system for toilet facilities with or without showers or tubs. Where laundry facilities exist, occupants should be advised to use "cold water" type detergents if washing difficulties are encountered.

3. In buildings operated on a nominal 40-hour week or in buildings operated on a nominal two-shift basis (either 5- or 7-day week), install a clock or other automatic control on the domestic hot water circulating pump or pumps to permit operation only during periods of actual occupancy, plus 30 minutes prior and 30 minutes after normal working hours.

4. In some older buildings or in some unusual cases, it may be necessary to do more than reset existing temperature controls. In some cases, added storage tanks, temperature blending equipment, or separate lines might be required. Where the aggregate of this work on any one installation meets the minimum for the Energy Conservation Investment Program (ECIP), consider including the work under this program provided ECIP amortization guidelines can be met.

5. It is not intended that there be any modification of the temperature of hot water used for dishwashing in dining halls and other food service areas, or hot water used in medical and dental facilities.

6. These requirements apply to family housing to the extent that water heaters installed in family quarters having dishwashers shall have water heater temperature settings of 140øF. Those quarters not having dishwashers shall have water heater temperature settings of 120øF. Changes in temperature settings will be made at change of occupancy or in connection with other work performed in the quarters.

4507. BOILER WATER TREATMENT

1. Background

a. Effective boiler water treatment can reduce corrosion in condensational lines and control sludge or scale from the water and steam sides of boiler plants.

b. In the past, some Marine Corps activities have used the Bureau of Mines industrial water laboratory services; i.e., water treatment 3-day workshops and test kits, etc. Due to budget cuts, these services are no longer available.

2. Information

a. Satisfactory boiler water treatment is determined by chemical residual tests and physical inspections.

b. NAVFACENGCOM and geographical EFD's are responsible for providing technical assistance on boiler feedwater conditioning procedures. EFD's will also assist in finding replacement services for those formerly provided by the Bureau of Mines.

c. Activities with adequate laboratory facilities and personnel may perform the tests necessary for efficient and economical plant control in-house. Other activities may contract out for such services or obtain these services from a nearby Government activity with in-house capability.

3. Action

a. Activities having steam systems shall establish a cost-effective boiler water treatment program.

b. Activities shall use the technical expertise and experience of the NAVFACENGCOM EFD's regarding the testing and treating of boiler water. A copy of any request for assistance from the EFD shall be forwarded to the CMC (LFF).

4. Reserve Applicability. This section applies to the Marine Corps Reserve.

4508. CONSERVATION CHECKLIST FOR WATER AND SEWAGE

1. Check for leaks in distribution lines, and ensure that there are no illegal tie-ins.

2. Encourage water users to do the following:

a. Avoid letting water run continuously when washing dishes, cleaning vegetables, brushing teeth, shaving, washing hair, or getting a cool drink. Keep a bottle of water in the refrigerator.

b. Avoid using the toilet to dispose of trash.

c. Avoid using the clothes washer or dishwasher for less than a full load.

d. Set toilet reservoirs for the lowest adequate flushing capacity.

e. Avoid washing the car with a free-running hose (use a pail to wash; and save the hose for a fast, efficient rinse, using a spray nozzle).

f. Avoid careless lawn sprinkling. Lawns can only absorb a certain amount of water. If your lawn becomes saturated, or if the sprinkler is placed so water runs off into the street or gutter, you are wasting water.

g. Repair leaks immediately as they become known. Especially important is the silent toilet bowl leak, where a worn or poorly seated valve or some other minor adjustment allows water to leak from the tank to the bowl. For detection, place a few drops of food coloring in the tank. If the color shows up in the bowl, there is a leak.

3. Install water-saving plumbing fixtures.

4. Minimize the number of backwashes for water treatment plants and swimming pools.

5. Quickly repair all steam distribution line leaks, and reduce boiler blowdown to a minimum to minimize boiler make-up water.

6. Maintain authorized building and domestic hot water temperatures.

CHAPTER 4

CONSERVATION

SECTION 6: COMPRESSED AIR AND GAS SYSTEMS

4600. OPERATION AND MAINTENANCE MANUALS. Activities should use NAVFAC MO-206 (Operation and Maintenance of Air Compressor Plants) and NAVFAC MO-220 (Operation of Gas Systems) as guides for O&M personnel.

4601. CENTRAL SYSTEM. A central compressed air system shall be installed to serve the various shops when the quantity is sufficient to make a central system economical. Where this is not economically feasible, individual compressors shall be located in the various shops, preferably to serve two or more sections of the shop. The compressors and all appurtenances to the system shall conform to the standards of the American Society of Mechanical Engineers.

4602. CONSERVATION CHECKLIST FOR COMPRESSED AIR AND GAS SYSTEMS

1. Many conservation techniques for heating (including fuels) apply to gas systems. Refer to paragraph 4206.

2. Initiate aggressive program of inspection of distribution lines and repair leaks as soon as possible.

3. Compressed air system requirements should be surveyed to ensure a properly sized compressor is being used.

4. A two compressor (dual) system might be more efficient than a system with one large unit. Advantages include:

a. One compressor operates fully loaded, at top efficiency, while the other operates intermittently to handle fluctuating air demands on the system.

b. Two compressors, particularly the newer compact units, can be placed at random in the plant, closer to the points of air use. This decentralization increases system efficiency; simplifies piping and, if an air receiver is used for each compressor, smooths air line pulsations for better air tool operation.

c. If a breakdown occurs in one unit, the second machine can be kept running to avoid a total shutdown.

5. Installation of constant speed control devices will reduce the wear on equipment and operating costs.

6. Compressor air intakes should be installed in the coolest locations to increase efficiency.

CHAPTER 4

CONSERVATION

SECTION 7: FACILITIES

4700. OPERATION AND MAINTENANCE MANUALS. Refer to MCO P11000.7 for guidance. Appendix A to this Manual provides specific reference material.

4701. DESIGN CRITERIA

1. Creative, energy-conscious design of Marine Corps buildings will save money and energy resources, ease burdens on power-plants, and reduce air and water pollution.

2. Criteria. Activity commanders shall ensure that energy conservation is considered at the earliest planning stage for every new building. DoD 4270.1-M and associated MIL-HDBK-1190 (chapters 1, 3, 5, 6, and 8) contain many suggestions/requirements for conservation of energy. In addition, the following guidelines apply:

a. Reduce environmental requirements as much as possible.

b. Select/develop sites and building structure so as to minimize energy consumption (i.e., provide minimum wall and glass exposure to west, southwest, and south; and minimize the use of glass).

c. Combine facilities and systems to take advantage of diversity.

d. Do not oversize equipment.

e. Use energy conservation systems, and select mechanical/electrical equipment which requires less energy for a given task. Specifically:

(1) Air-conditioning systems of 60,000 Btu/h and less (except window type) shall deliver not less than 7.5 Btu per watt input. (Use the "Directory of Certified Unitary Air-Conditioners" published by the Air-Conditioning and Refrigeration Institute.)

(2) Window-type air-conditioning units shall produce not less than 8.5 and 8.0 Btu per watt input for 120 and 230 volts

power supply, respectively. (Use the "Directory of Certified Room Air-Conditioners" published by the American Home Appliance Manufacturers.)

(3) Electric hot water heaters of 89-gal capacity and less shall have maximum power input of 4,500 watts and be of the dual-heating-element type.

f. Use double glazing, wherever feasible. An economic analysis is required for projects involving personnel living spaces to determine if double glazing is feasible.

g. Designs for personnel living spaces (including "turnkey" projects) shall meet the energy conservation requirements of DoD 4270.1-M and associated MIL-HDBK-1190.

4702. PERFORMANCE EVALUATION. Figure 4-4 provides an example of the impact of new construction on energy consumption.

4703. CONSERVATION CHECKLIST FOR FACILITIES

1. "Think Conservation" during the preliminary design, development, and construction of new facilities and equipment.

2. Orient buildings to reduce solar heat loads; use passive solar design.

3. Site buildings close to existing utilities to reduce distribution line losses.

4. Use energy conservation techniques, such as economy cycle, run around cycle, air-cooled or water-cooled lighting fixtures, rotary heat exchangers, variable air volume system, etc.

5. Where possible, secure systems during nonheating and/or noncooling seasons.

6. Minimize off-hours energy use.

a. Eliminate nighttime janitorial service.

b. Minimize overtime work.

c. Consolidate separate shift and weekend functions.

7. Institute an energy conservation hot line to receive conservation suggestions, reports of violations of standards, and reports of needed maintenance.

8. Ensure that utilities systems are deactivated to all unused buildings.

POTENTIAL/ACTUAL UTILITY CONSUMPTION AND RATE INCREASES/DECREASES REPORT

REPORT SYMBOL: EXEMPT

ACTIVITY UIC: _____ PURCHASED UTILITY: ELECTRIC

ACTIVITY NAME: _____

DATE	NATURE OF CHANGE ACTUAL = A POTENTIAL = P CONSUMPTION = C (A/P/C + D)	CONSUMPTION (KWH, GALS, FT³, THERMS, ETC.	UNIT PER UNIT COST/UNIT OF CONSUMPTION	INCREASE IN COST FOR EFFECTIVE FY PRICES ($000)	TOTAL COST ($000)	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)
BUDGET 10-1-8_	—	1,000,000 KWH	$ .05/KWH	—	$500	BUDGET
10-30-8_	PC	1,100,000 KWH	$ .05/KWH	$ 50 FOR FISCAL YEAR	$550	BUILDING #4 COMMISSIEK FACILITY BOO 9-30-8_
11-30-8_	AR	1,100,000 KWH	$ .05/KWH	$ 350 FOR FISCAL YEAR	$850	SEE ATTACHED REVISED RATE SCHEDULE DATED 7-30-8_
1-30-8_	PR	1,100,000 KWH	$ .05/KWH	$ 44 FOR 8 MONTHS	$894	7.85% INCREASE DUE ON 2-91-8_ PER NEWSPAPER ARTICLE/BILLING ATTACHED
3-31-8_	AR	1,100,000 KWH	$ .05/KWH	$ 18 FOR 8 MONTHS	$912	INCREASE LESS THAN PREVIOUSLY INDICATED PER ATTACHED RATE SCHEDULE
6-30-8_	AC	1,050,000 KWH	$ .05/KWH	$ 15 FOR FY	$927	CONSUMPTION LESS THAN PREVIOUSLY ESTIMATED
8-02-8_	—	—	—	—	$400	ADDITIONAL FUNDS PROVIDED AT MID-YEAR REVIEW
9-30-8_	—	—	—	—	$895	FUNDS OBLIGATED FOR PURCHASED UTILITY DURING FISCAL YEAR

Figure 2-7.--Potential/Actual Utility Consumption and Rate Increases/Decreases Report (EXEMPT).

Figure 4-4.--Impact of New Construction Energy Consumption.

CHAPTER 4

CONSERVATION

SECTION 8: TRANSPORTATION

4800. RIDESHARING PROGRAM

1. Policy. Promote ridesharing throughout all Marine Corps activities.

2. Background. In January 1981, activities were advised of a Presidential requirement to promote ridesharing through designation of an employee transportation coordinator, distribution of literature, and conduct of a transportation survey. These actions were taken to conserve energy, reduce traffic congestion, improve air quality, and expand options for safe and economical personal travel.

3. Information

a. Ridesharing is any mode of commuting not involving driving alone in one's personal automobile or van.

b. Ridematching is any system for mapping and matching home and work locations to identify prospects for ridesharing.

c. The major element to an effective ridesharing program is appointment of an employee transportation coordinator. The coordinator will manage ridesharing and ridematching services at the activity level.

d. At HQMC, the point of contact for ridesharing is CMC (LFF).

4. Action

a. Activity commanders shall promote an activity ridesharing program and shall:

(1) Appoint an employee transportation coordinator.

(2) Provide for flexibility in working hours.

(3) Reserve conveniently located parking spaces for carpool and vanpools.

(4) Schedule meetings at times that will not interfere with ridesharing arrangements.

(5) Recognize employees through awards when valuable ridesharing ideas are contributed.

(6) Assist in developing employee ridematching services.

b. The name and telephone number of the employee transportation coordinator of metropolitan area activities (i.e., CG MCCDC, Quantico, MCAS, El Toro, CG MCRD/WRR, San Diego, CO MCAS, Tustin, CO MarBk, Washington, CO HqBn, Henderson Hall) shall be on file with the CMC. Change of coordinators at these six activities shall be telephoned to the CMC (LFF) point of contact within 60 days of occurrence.

4801. CONSERVATION RECOMMENDATIONS FOR TRANSPORTATION

1. Establish a driver education program specifically teaching energy conserving driving techniques.

2. Consolidate Government vehicle trips through scheduling.

3. Use bicycles for on-installation transportation.

4. Reemphasize and rigidly enforce speed limits.

5. Assign a motor pool mileage reduction goal.

6. Strictly monitor and enforce fuel accountability.

7. Provide and widely advertise on-base bus and taxi service.

8. Minimize class A and B assignments (permanent or continuing assignments).

9. Carpooling shall be encouraged by assignment of preferred parking to carpools.

10. Marine Corps-owned/ -leased/ -rented commercial vehicles shall be pooled, wherever possible.

11. Compact/subcompact commercial sedans and station wagons shall continue to be purchased for Marine Corps fleet replacement.

12. A maximum speed limit of 55 miles per hour should be maintained for all Government vehicles as long as safety and mission considerations permit.

13. Weapons, equipment, and flight demonstrations should be the minimum considered essential for training and recruiting.

14. Large-scale energy intensive exercises should be kept at a level required to maintain operational readiness. Exercise sponsors shall include energy requirements and conservation potential for the alternatives available in any environment impact assessment/statement prepared for the exercise.

APPENDIX A

Pertinent DoD, Marine Corps, and NAVFACENGCOM Publications

Number	Title
MO-114	Building Maintenance; Plumbing, Heating, and Ventilation
MO-115	Building Maintenance; Air-Conditioning and Refrigeration
MO-200	Electric Power Distribution System Maintenance
MO-201	Operation of Electric Power Distribution System
MO-202	Control of Electromagnetic Interference on Overhead Power Lines
MO-203	Wire Communication and Signal System Maintenance (6 volumes)
MO-204	Electric Power Systems Analyses
MO-205	Central Heating and Steam Electric Generating Plants (5 volumes)
MO-206	Operation and Maintenance of Air Compressor Plants
MO-207	Operation and Maintenance of Internal Combustion Engines
MO-209	Maintenance of Steam Hot Water and Compressed Air Distribution Systems
MO-210	Water Supply System
MO-212	Sewerage and Industrial Waste Disposal System
MO-213	Solid Waste Management
MO-220	Maintenance and Operation of Gas Systems (Tri-Service)
MO-230	Maintenance Manual Petroleum Fuel Facilities
MO-303	Utility Targets
MO-304	Utilities Systems Analysis
MO-306	Corrosion Prevention and Control

Pertinent DoD, Marine Corps, and NAVFACENGCOM Publications

Number	**Title**
MO-307	Corrosion Control by Cathodic Protection
MO-321.1	Maintenance Management of Public Works and Public Utilities for Small Activities
MO-322	Public Works and Public Utilities; Inspection for Maintenance of (3 volumes)
DOD 4140.25	Management of Bulk Petroleum Products, Facilities and Services
DOD 4160.21M	Defense Disposal Manual
DOD 4170.10	Energy Management Policy
DOD 4270.1-M and Associated MIL-HDBK-1190	Policy Guidelines for Installation, Planning, Design, Construction and Upkeep
DOD 5126.46-M	Defense Energy Information System (DEIS) Manual
MCO P4860.3	Policy and Procedures for the Starting, Expanding or Curtailing of In-House Utilities Services
MCO P7100.8	Marine Corps Budget Manual
MCO P7300.8	Financial Accounting Manual
MCO P11000.5	Facilities Projects Manual
MCO P11000.7	Facilities Maintenance Management
MCO P5090.2	Environmental Compliance and Protection Manual
MCO P11000.12	Facilities Planning and Programming
MCO P11000.16	Introduction to Facilities Management
NAVFAC P-68	Contracting Manual
NAVFAC P-355.1	Seismic Evaluation of Supports for Existing Electrical-Mechanical Equipment and Utilities
NAVFAC P-442	Economic Analysis Handbook
NAVFAC P-1023	Utilities Systems Vulnerability Assessment Guide
NAVFAC 11300.7	Minimum Attendance for Shore Boiler Plants

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

Pertinent DoD, Marine Corps, and NAVFACENGCOM Publications

Number	**Title**
NAVFAC 11300.18	Sewage Disposal Service Contracts with Regional Authorities and Local Governments, where Federal and/or State Grants of Funds are Being Considered or Have Been Made
NAVFAC 11300.29	Utilities Procurement Analysis System
NAVFAC 11300.30	Design and Installation of Uninterruptible Power Supply (UPS) System Procedures
NAVFAC 11300.31	Energy Engineering Program, Utility Distribution System Element Guidelines
NAVFAC 11300.32	Navy Shore Facilities Heating and Power Plant Optimization Element of the Energy Engineering Guidelines
NAVFAC 11300.35	Operating Record Forms for Potable Water and Wastewater Treatment Plants
NAVFAC 11310.2 and Ch 1	Mobile Utilities Support Equipment (MUSE) Program
NAVFAC 11310.15	Computer Assisted Utility System Evaluation Program
NAVFAC 11310.40	Procedures for Handling Department of Energy Reports of Coal Analyses
NAVFAC 11310.45	Utility Systems Assessments and Utility Technical Studies
NAVFAC 11330.11	Backflow Preventers, Reduced Pressure Principle Type
NAVFAC 11330.12	Boiler Water Treatment and Control Limits for Package (Shop-Assembled) Water Tube Boilers
NAVFAC 11330.14	Safe Drinking Water at Naval Shore Activities
NAVFAC 11380.6	Air-Conditioning Tune-Up Program
NAVMC 2733	Energy Conservation in Dining Facilities
OPNAV 41P6	Shore Facility Energy Officers Guide

Federal Property Management Regulation:

41CFR Part 101-20.107	Cooling and Heating Energy Conservation Policies and procedures

Current Status of Defense Energy Program Policy Memoranda

No.	Title	Status
78-8	Department of Defense-Department of Energy Memorandum of Understanding	In Effect
78-9	Use of Department of Defense Fuel Stocks to Support Non-DoD Consumers	In Effect
81-4	Building and Hot Water Temperature Restrictions	In Effect
81-9	Acquisition of Gasohol for Use in DoD Motor Vehicles	In Effect
84-3	Department of Defense Support to the U.S. Secret Service	In Effect
84-8	Energy Management Monetary Awards Program	In Effect
85-2	Energy Conservation Investment Program (ECIP)	In Effect
85-3	Third Party Funding of Facilities	In Effect
85-4	Facilities Energy Life-Cycle Cost Criteria	In Effect
86-2	Defense Facilities Energy Security Program	Canceled
91-2	Implementing Defense Energy Management Goals	In Effect
92-1	Department of Defense Energy Security Policy	

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

APPENDIX B

GLOSSARY OF DEFINITIONS

ACQUISITION. To acquire ownership of real property by any means, except by lease agreements.

ACTIVITY. A unit of the Marine Corps with a distinct identity established ashore with the primary mission of providing base operating support to tenant activities or functions. The activity consists of personnel, facilities, and an operating budget necessary to support the assigned mission. An activity is categorized, mainly by overall size, as a major or minor activity. See appendix D for a detailed listing.

ACTIVITY COMMANDER. The commanding general, commanding officer, or, in the case of a Reserve activity, the inspector-instructor of a Marine Corps Reserve activity.

ADMINISTRATIVE AND SIMILAR BUILDINGS. Buildings owned or leased by the Marine Corps, used predominantly for nonindustrial activities such as headquarters operations, training (except simulator facilities), accounting and recordkeeping, laboratories, dining halls, hospitals, and housing. Excluded are industrial facilities.

ALTERNATIVE, RENEWABLE, AND CLEAN ENERGY. These types of energy included energy from all unconventional sources, energy recovered from conversion, and energy producing low emissions. Examples include solar energy, photovoltaics, wind energy, geothermal energy, landfill methane, fuel cells, hydrogen combustion, etc.

ALTERATION. Work required to adjust interior arrangement, location, or other physical characteristic of an existing facility so that it may be more effectively adapted to or used for its designated purpose. The following are examples of alterations:

a. Erect or remove permanent partitions, install additional doors or windows, or add a mezzanine (if attached to or part of the building). Generally, partitions which become class 2 property after installation are alterations, whereas relocatable partitions or mezzanines which remain on the class 3 plant property record after installation are not alterations.

b. Install air-conditioning, evaporation cooling, or mechanical ventilating equipment in an existing building. Additional requirements for air-conditioning projects are contained in chapter 4, section 4, of this Manual.

c. Modify the electrical system within a building by increasing its capacity.

d. Construct a fire escape on a building.

BACKLOG OF MAINTENANCE AND REPAIR (BMAR). End of fiscal year measurement of maintenance and repair work remaining as a firm requirement of the annual plan but which lack of resources prohibit accomplishment in that fiscal year.

COMPETITIVELY SELECTED FIRMS. As applicable to utility company conservation and demand side management programs, means a certification or statement by the utility that their normal competitive procedures were used to select firms for implementation of these programs.

CONSTRUCTION. To erect, install, or assemble a new facility; to add, expand, extend, alter, convert, or replace an existing facility; or to relocate a facility from one activity to another. This includes real property equipment installed and made a part of such facilities and related site preparation, excavation, filling, landscaping, or other land improvement. Construction includes adding, expanding, and extending, any physical increase to a real property facility which adds to the overall external dimension of the facility. Normally, such work will result in an increase of physical statistics contained on real property record cards. Examples of work in these categories are:

a. **Addition**. Increasing the length, width, or height of a building or facility.

b. **Expansion.** Increasing the production capacity of a utility plant by adding a water filter or increasing storage capacity of a water plant.

c. **Extension.** Increasing the length of a water distribution line.

CONVERSION. A major structural revision of a real property facility which changes the functional purpose for which the facility was originally designed or used; e.g., a major structural revision of a barracks to convert a sleeping area into office space, a Marine Corps exchange, or a club. Adapting nonload-bearing partitions, relocating or removing plumbing fixtures, or other minor changes are examples of alteration rather than conversions.

CONTRACT ADMINISTRATION. The process of making payments and assuring that a contractor provides that which is required under a contract. Includes monitoring contractor progress, performing quality assurance, providing or obtaining technical reviews and approvals and advising the contracting officer and others on matters related to contractor performance.

CUSTOMER. An activity, component of an activity, unit, organization, or tenant which is authorized by an activity commander to request any type of facilities support.

DEMAND SIDE MANAGEMENT (DSM). DSM consists of limiting power and energy demands on the utility system by conservation and/or shifting loads to off peak periods, DSM may or may not reduce energy use, DSM is primarily designed to reduce costs by "averaging" daily electrical demands to reduce a utility's requirement to invest in facilities and equipment to satisfy peak period demand.

DoD CATEGORY CODE. A three-digit system of numbering and common nomenclature for classes 1 and 2 plant property; i.e., land, buildings, structures, and utilities. (See NAVFAC P-72 (Category Codes for Classifying Real Property of the Navy).)

ENERGY CONSERVATION. Energy conservation consists of actions such as improving operations and maintenance, installing materials, devices, instruments, or equipment or eliminating energy loads, to reduce the amount of energy needed in a facility. Conservation actions would include upgrading the efficiency of lighting equipment, heating, ventilation, and cooling systems, building insulation, glazing, improved maintenance, etc. Electrical energy will be reported on the basis of "site" energy content, that is 3,412 Btu's per kWh.

ENGINEERING FIELD DIVISION (EFD). A geographical engineering field division of the Naval Facilities Engineering Command.

FACILITY. A separate, individual building, structure, or other item of real property improvement which is subject to reporting the DoD real property inventory.

a. Commercial Facility. A nonindustrial facility which furnishes services or items which are commonly available in the civilian economy, together with the land used in conjunction with the facility. For example, bakers; laundries; warehouses; dry-cleaning plants; marine piers and terminal; marine storage facilities; open storage; petroleum, oils, and lubricants storage; plants; cold storage; retail sales facilities; utility plants and related facilities; and maintenance and repair facilities.

b. Dissimilar Real Property Facilities. Facilities having different three-digit basic category codes. (See NAVFAC P-72.)

c. Similar Real Property Facilities. Facilities having the same three-digit basic category code. (See NAVFAC P-72.)

FACILITY SUPPORT CONTRACTS (FSC). Contracts used primarily to accomplish the repair or maintenance of real property facilities, vehicles, or equipment, or to restore to initial or usable condition by overcoming the effect of weather, disaster, damage,

or deterioration or to perform periodic services required to preserve facilities in a usable, operable condition.

FUNCTIONAL PURPOSE. The use made of a facility or part thereof, expressed in the general terms listed as basic categories in NAVFAC P-72. As used herein, the term functional purpose shall be considered as applying to the purpose to be served after completion of the construction.

INDUSTRIAL FACILITIES. Facilities used predominantly for manufacturing, maintenance, overhaul, warehousing, similar processes, including Government-owned, contractor-operated facilities. Energy support to ships in port and aircraft on the ground is excluded.

INSTALLED EQUIPMENT. Sometimes called "built-in-equipment," this is acessory equipment and furnishings required for operation and are affixed as a part of the real property facility. The equipment is engineered and built into the facility as an integral part of the final design and is an essential part thereof. See MCO P11000.5 for guidance on project preparation.

LEAD ACTIVITY. An activity which provides maintenance-type services on a reimbursable basis to another activity per the terms of a intraservice or interservice support agreement. A lead activity relationship is distinguished from a host-tenant relationship in that a lead activity does not provide facilities to the activity it services.

MAINTENANCE. The recurrent day-to-day, periodic, or scheduled work required to preserve or restore a facility to such condition that it may be effectively used for its designated purpose. Maintenance includes work undertaken to prevent damage to a facility which otherwise would be more costly to restore.

MAINTENANCE STANDARDS. The established level at which facilities and grounds are maintained to assure maximum overall economy and protection of the Government’s investment.

MINOR CONSTRUCTION. Work to erect, install, or assemble a new facility or to expand, alter, or convert an existing facility to another use. Minor construction refers only to such work authorized to be accomplished with O&M funds. See MCO P11000.5.

MODERNIZATION. Replacement of fixed items before they become unserviceable with similar items which meet modern day standards (construction).

NAVFACENGCOM. The Naval Facilities Engineering Command.

OTHER ENGINEERING SUPPORT. Miscellaneous activity support functions applicable to RPMA, such as public works engineering

and administration, custodial services, entomology services, refuse collection and disposal, fire protection services, and environmental control.

PLANT PROPERTY CLASSES. Plant property (see the NavCompt Manual, volume 3, chapter 6) is briefly identified as follows:

a. Real Property

(1) Class 1, land. (See NavCompt Manual, paragraph 036102 and NAVFAC P-78.)

(2) Class 2, buildings and improvements (structures, roads, playing fields, etc.). See NavCompt Manual, paragraphs 036101 and 036102 and NAVFAC P-78.

b. Personal Capital Plant Equipment

(1) Class 3, equipment (other than industrial plant equipment).

(2) Class 4, industrial plant equipment.

PREVENTIVE MAINTENANCE INSPECTION. Continual inspection involving systematic examination, lubrication, and adjustment of classes 2, and 4 equipment to which an operator is not assigned or the inspection of which an operator's authority. The work is authorized by a standing job order which specifies work center tasks and time limitations. Preventive maintenance inspection on class 2 equipment shall be limited to 30 work-minutes per task and 20 work-minutes per task on classes 3 and 4 equipment. In addition, preventive maintenance inspection may include repair of equipment when the time to accomplish the work is less than 20 work-minutes on any one item of equipment. The selection of classes 2, 3, and 4 equipment to be inspected and the establishment of inspection frequencies shall be governed by consideration of economy.

PROJECT. A single planned undertaking of construction, alteration, repair or maintenance work, either separately or in combination, necessary to satisfy a finite requirement.

PUBLIC WORKS CENTER. A Navy field activity normally operated under the Navy Industrial Fund (NIF). A public works center renders RPMA services similar to lead activities but is governed by NIF regulations. Reimbursement for services must include direct costs and overhead.

REAL PROPERTY MAINTENANCE ACTIVITIES (RPMA). Includes the following specific functions: maintenance and repair of all buildings, grounds, paved surfaces, utilities systems, and other real property; the operation of utilities systems, including utilities purchases; other engineering support services, such as

maintenance and public works administration and engineering, custodial, entomology, refuse collection and disposal, fire protection services, and environmental control; and minor construction, improvements, and alterations.

REIMBURSABLE WORK. Work authorized by a standing or specific job order, the cost of which is reimbursable per prescribed Marine Corps instructions, to the appropriation Operations and Maintenance, Marine Corps (O&MMC). The work may be performed for family housing; other military services, including Marine Corps activities not supported by the CMC; morale, welfare, and recreation activities; and private parties, including concessionaires, contractors, and tenants of rental housing.

REPAIR. The restoration of a facility to such a condition that it may be effectively used for its designated purposes by overhaul, reprocessing, or replacement of constituent parts or materials which have deteriorated by the elements or use, and which have not been corrected through maintenance.

RESOURCES. Consists of military and civilian personnel, material and equipment on hand, and the financial assets available for work performance assigned to the maintenance department.

SHOP DAYS. A unit of measure used to express a shop workload in terms of days.

WORK REQUEST. A form used to request the maintenance department to perform work or prepare a cost estimate for specified work.

OFFICER IN CHARGE (OIC) /OFFICER IN CHARGE OF CONSTRUCTION (OICC). An individual (Civil Engineer Corps Officer) who is the head of a procuring contracting office. This position does not import any contracting officer authority, which is independently authorized by certificate of appointment (warrant). Those with contracting authority are also "contracting officers."

APPENDIX C

ABBREVIATIONS/ACRONYMS

A&E	Architectural and Engineering
BMAR	Backlog of Maintenance and Repair
BFR	Basic Facilities Requirement
Btu	British Thermal Unit
BY	Budget Year
CEC	Civil Engineer Corps
CMC	Commandant of the Marine Corps
CO NEESA	Commanding Officer, Naval Energy and Environmental Support Activity
CY	Calendar Year
>Ch 3 DUERS	Defense Utility Energy Reporting System
DLA	Defense Logistics Agency
DoD	Department of Defense
DOE	Department of Energy
EAR	Energy Audit Report
ECIP	Energy Conservation Investment Program
EFD	Engineering Field Division
EUIP	Energy Utilities Initiatives Program
EMCS	Energy Monitoring and Control System
FAR	Federal Acquisition Regulations
FHMA, D	Family Housing Management Account, Defense
FMF	Fleet Marine Force
EPAA	Emergency Petroleum Allocation Act
FPC	Federal Power Commission
FSC	Facility Support Contract
FSCM	Facilities Support Contract Manager

FY	Fiscal Year
FYDP	Five-Year Defense Plan
GOCO	Government-Owned Contractor Operated
HCO	Head of the Contracting Office
HQMC	Headquarters U.S. Marine Corps
HVAC	Heating, Ventilation, and Air-Conditioning
JUSB	Joint Utilities Service Board
kWh	Kilowatthour
MILCON	Military Construction
MCNR	Military Construction, Naval Reserve
MCON	Military Construction, Navy
MRP	Maintenance of Real Property
MSE	Mobility Substitution Energy
MUSE	Mobile Utilities Support Equipment
NAF	Non-Appropriated Funds
NAVFACENGCOM	Naval Facilities Engineering Command
NEESA	Naval Energy and Environmental Support Activity
NIF	Naval Industrial Fund
OICC	Officer in Charge/of Construction
O&MMC	Operations and Maintenance, Marine Corps
O&MMCR	Operations and Maintenance, Marine Corps Reserve
O&MN	Operations and Maintenance, Navy
OMES	Operations Maintenance Energy Service
OPN	Other Procurement, Navy
OSD	Office of the Secretary of Defense
POA&M	Plan of Action & Milestones
PCO	Procuring Contracting Officer

RDF	Refuse Derived Fuel
RPMA	Real Property Maintenance Activities
SES	Shared Energy Savings
SIR	Savings to Investment Ratio
SIOH	Supervision, Inspection and Overhead
TTC	Technical Training Center
UCAB	Utilities Conservation and Appraisal Board
UCAR	Utilities Cost Analysis Report
UIC	Unit Identification Code
UPW	Uniform Present Worth

APPENDIX D

LIST OF MARINE CORPS ACTIVITIES

Activity Mission and Chain of Command	Category Major	Minor
Unit Training		
MCAB's, Eastern Area		
MCAS, Cherry Point, North Carolina	X	
MCAS, Beaufort, South Carolina	X	
MCAS, New River, North Carolina	X	1/
MCAB's, Western Area		
MCAS, El Toro, California	X	
MCAS, Yuma, Arizona	X	
MCAS, Tustin, California	X	2/
MCB's		
MCB, Camp Lejeune, North Carolina	X	
MCB, Camp Pendleton, North California	X	
MCAGCC, Twentynine Palms, California	X	
MCMWTC, Bridgeport, California	X	3/
FMF, Atlantic, Command		
Camp Elmore, Norfolk, Virginia	X	
MCB's Pacific		
MCAS, Fuenma, Okinawa	X	4/
MCAS, Kaneohe Bay, Hawaii	X	
MCAS, Iwakuni, Japan	X	
Camp Smedley D. Butler, Okinawa (Includes Camp Funji)	X	
Camp H.M. Smith, Hawaii	X	
Recruit and Specialized Training		
MCCDC, Quantico, Virginia	X	
MCRD/ERR, Parris Island, South Carolina	X	
MCRD/WRR, San Diego, California	X	

Activity Mission and Chain of Command	Category Major	Minor
Central Supply and Maintenance		
MCLB, Albany, Georgia	X	
MCLB, Barstow, California	X	
Administration		
MarBks, 8th and I Street, SE., Washington, DC		X
HqBn, HQMC Henderson Hall, Arlington, Virginia		X
MCFC, Kansas City, Kansas		X 5/
Marine Corps Districts (MarCorDist)		
1st MarCorDist, Garden City, Long Island, New York		X 6/
4th MarCorDist, Philadelphia, Pennsylvania		X
6th MarCorDist, Atlanta, Georgia		X
8th MarCorDist, New Orleans, Louisiana		
9th MarCorDist, Overland Park, Kansas		X
12th MarCorDist, San Francisco, California		X
Reserve Training/Readiness		
4th MarDiv (Reinforced), New Orleans, Louisiana	X	
4th MAW, New Orleans, Louisiana	X	

The activities identified are provided RPMA support by the activities indicated as follows:

1/ Receives support from MCB, Camp Lejeune.

2/ Receives support from MCAS, El Toro.

3/ Receives support from MCB, Camp Pendleton.

4/ Receives support from Camp Butler, Okinawa.

5/ The MCFC has only family housing RPMA.

6/ This Manual is applicable only to those districts which are holders of class 1 or 2 real property. Presently this applies only to the 1st Marine Corps District.

APPENDIX E

INSPECTION AND PREVENTIVE MAINTENANCE ELEMENTS

A. MAINTENANCE PLANNING. Maintenance planning must anticipate and prevent, to the greatest extent possible, interruptions in utilities systems operations and the associated loss of output or capacity caused by equipment breakdown and deterioration. A coordinated inspection and maintenance program must anticipate the eventualities of breakdowns in the gradual reduction of system efficiency as equipment wears out. Utilities maintenance needs should be determined through periodic inspections of all utilities equipment and associated facilities. A continuous inspection program includes operator inspection, control inspections, and preventive maintenance. While in no means all-inclusive, the following list of elements should serve as the basis of an installation's inspection and maintenance program. Maintenance work accomplished by the utilities or maintenance division is chargeable to functional category M, Maintenance of Real Property.

B. HEATING PLANTS

1. Manned Steam Heating Plant

a. Operate Manned Steam Heating Plant. Inspect, operate, provide surveillance of all coal, oil, and gas fired heating plant equipment.

(1) Inspect Equipment. Perform inspection of equipment to ensure proper operation and to determine if maintenance is required.

(a) Inspect Boiler and Valve. Inspect handhole gasket, blowdown valve, fire box for internal or external leakage, safety valves for leakage, and header valve for packing, corrosion on stem, flange gasket, and leakage.

(b) Inspect Upper and Lower Soot Blower. Inspect for overheating, and check gears and oil level.

(c) Inspect Boiler Oil Positioning Valve. Inspect for leakage, and check packing.

(d) Inspect Boiler Gas Positioning Valve. Inspect for leakage, corrosion, and freeness of valve.

(e) Inspect Oil Bypass Valve. Inspect for leakage, and check padding.

(f) Inspect Gas Pilot and Oil Line Solenoid Valve. Inspect for leakage and corrosion.

(g) Inspect Normal and Emergency Make-up Pump. Inspect for leakage, and check packing and oil.

(h) Inspect Chemical Pump. Inspect for leakage; check packing, check valves, grease, and oil.

(i) Inspect Deaerator Tank. Inspect for leakage, check cleanliness; check for dissolved oxygen.

(j) Inspect Deaerator Tank Level Control-Filling Valve.

(k) Inspect Deaerator Tank Heater Coil Regulator Valve and Automatic Blowdown. Inspect for leakage.

(l) Inspect Deaerator Tank Relief Valve. Inspect for leakage and check valve seating.

(m) Inspect Boiler Circulating Pump. Inspect for leakage and overheating; and check bearings, cooling water, oil, and freeness of shaft.

(n) Inspect Motorized Value. Inspect for leakage and corrosion, and check packing.

(o) Inspect Pneumatic Mixing Value. Inspect for leakage and corrosion, and check air pressure and packing.

(p) Check Value. Inspect for leakage.

(q) Inspect Water Level Glass and Shut-off Valve. Inspect for leakage and check packing.

(r) Inspect Value to and from Water Column. Inspect for leakage and check packing.

(s) Inspect Automatic and/or Manual Blowdown Line and Valve. Inspect for leakage and corrosion, and check packing.

(t) Inspect Safety Shut-off Gas Valve. Inspect for leakage and corrosion, and check for freeness of valve.

(u) Inspect Combination Oil-Gas Burner. Inspect for leakage, and check flexible tubing and freeness of louvers.

(v) Inspect Gas Valve. Inspect for leakage; check packing.

(w) Inspect Force Draft Fan. Inspect fan blades, and check bearings and lubrication.

(x) Inspect Medium Temperature Hot Water (MTHW) to Oil Tank Motorized Valve. Inspect for leakage and corrosion, and check packing.

(y) Inspect Oil Heater Relief Valve. Inspect for leakage and check valve seating.

(z) Inspect MTHW to Oil Heater Regulator. Inspect for leakage and check diaphragm.

(aa) Inspect Oil Pump. Inspect for leakage and overheating; and check shaft, bearings, and packing.

(bb) Inspect Oil Strainer. Inspect for leakage and cleanliness.

(cc) Inspect Oil Heater Check Valve. Inspect for leakage.

(dd) Inspect Heating and Ventilating (HV) Unit Control Valve. Inspect for leakage and check packing.

(ee) Inspect HV Unit. Inspect for overheating and proper operation, and check filter and belts.

(ff) Inspect Unit Heater. Inspect for leakage and check motor.

(gg) Inspect Air Compressor. Inspect for air leakage and overheating of motor; check oil level, shaft, bearings, pulleys, safety guard, filters, and belts; and test safety cock.

(hh) Inspect Water Softner. Inspect for leakage.

(ii) Inspect Soot Blower Line Air Valve. Inspect for leakage.

(jj) Inspect Air Line Filter. Inspect for leakage and check filter.

(kk) Inspect MTHW Tank. Inspect for leakage and check relief valve.

(ll) Inspect System Circulating Pump. Inspect for leakage and overheating; and check bearings, cooling water, and freeness of shaft.

(mm) Inspect MTHW Make-Up Pump. Inspect for leakage, and check water and bearings.

(nn) Inspect MTHW Converter Relief Valve. Inspect for leakage and blockage, and check valve seating.

(oo) Inspect MTHW Expansion Tank. Inspect for leakage and blockage and check seating.

(pp) Inspect Piping. Inspect all piping and valves for leakage and corrosion; check packing, freeness of valves, and insulation of piping.

(qq) Inspect Coal Stoker. Inspect grates and grateshaking mechanism; check retort for warpage, burning, or accumulation of slag; inspect damper for proper operation.

(2) Operate Equipment. Operate equipment to ensure optimum use.

(a) Perform Start-Up.

1 Perform Cold Boiler Start-Up.

2 Perform Standby Boiler Start-Up.

(b) Maintain Combustion. Maintain proper combustion by adjusting combustion controls and draft regulators.

(c) Operate ORSAT Analyzer. Operate ORSAT analyzer, as, required to check on proper combustion.

(d) Change Burner.

(e) Drain Receiver Tank.

(f) Switch Oil Tank Heater. Switch oil tank heater during oil operation.

(g) Perform Blowdown. Blowdown air lines, air filters, and receiver tanks.

(h) Add Water to System.

(i) Perform Shutdown. Shutdown boiler per manufacturers' procedures.

(j) Perform Coal and Ash Handling.

1 Operate Coal Handling Equipment. Operate coal handling equipment within the plant by releasing the necessary quantity of coal into each individual boiler storage feed bin.

2 Hand Shovel Coal. Hand shovel coal into boiler stoker or boiler fire box.

3 Perform Ash Handling. Turn on vacuum system, open vacuum opening for the boiler from which the

ashes and clinkers are being removed, open boiler ash box, and replace vacuum opening door.

4 Remove Ashes Manually. Remove ashes from the boiler by shovel, load ashes into wheelbarrow, and transport to outside dump area.

(3) Provide Surveillance. Provide surveillance of heating plant equipment to ensure it is functioning properly and meets safety requirements.

b. Perform Recurring Maintenance

(1) Clean Equipment. Perform periodic cleaning, remove foreign matter, and clean filter strainer.

(2) Lubricate Equipment. Perform periodic lubrication.

(3) Adjust Equipment. Perform periodic adjustment and tighten bolts.

(4) Perform Replacement. Replace filter and gasket.

(5) Provide Corrosion Control. Coat equipment to provide corrosion control.

(6) Change Oil. Change oil for components

c. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction, and to determine the type of repair necessary.

(2) Repair Equipment. Remove part or component deemed either reparble or replaceable, restore item removed to a usable condition, or replace item removed with a like item.

(3) Perform Tests. Run equipment through test cycle.

d. Perform Chemical Analysis and Water Treatment. Conduct boiler water concentration analysis and water treatment.

(1) Perform Boiler Water Concentration Analysis. Conduct boiler water concentration analysis by collecting boiler water sample, prepare sample for shipment, and review analysis.

(a) Collect Boiler Water Sample. Collect sample of boiler water for analysis.

(b) Prepare Sample for Shipment. Prepare boiler water sample for shipment to EFD designated analysis point.

(c) Review Analysis. Review boiler water analysis to determine corrective action required.

(d) Perform Local Analysis. Collect sample of boiler water and perform local analysis.

(2) Perform Water Treatment. Add chemical to water to bring water to an acceptable level.

e. Maintain Instrumentation and Control

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction and to determine the type of repair necessary.

(2) Repair Equipment. Remove valve, switch, thermostat, regulator, and control panel deemed either reparable or replaceable; restore item removed to a usable condition, or replace item removed with like item.

(3) Calibrate Instrument and Control. Calibrate and adjust instrument and control to meet established tolerances and specifications.

(4) Perform Test. Run equipment through test cycle to ensure the malfunction has been corrected.

f. Perform Seasonal Overhaul. Perform seasonal overhaul of equipment or plant when system is shutdown.

(1) Overhaul Boiler Water Side. Remove handhole plate, screen, and orifice; replace with new orifice; back flush tube and header; inspect boiler water side for scale, corrosion, erosion or abrasion; clean handhole plate; inspect for pitting; resurface plate; reinstall handhole plate with new gasket; and hydrostatically test boiler.

(2) Overhaul Boiler Fire Side. Remove boiler access door; open burner; clean boiler fire side; inspect boiler tube for overheating and leakage; re-rolls tube; clean fire box; inspect refractory for cracks, openings, and spalling of brick; clean inspection glass; and inspect pressure part for scale, corrosion, abrasion, and abnormal wear.

(3) Overhaul Boiler External Fittings. Inspect safety valve and escape pipe support; repair insulation; inspect thermometer, well, and sampling line; clean and adjust oil and gas burner; clean, inspect, and align soot blower; and repair and calibrate gauge.

(4) Overhaul Expansion Tank. Drain expansion tank; remove manhole plate; wash and dry tank interior; inspect for corrosion, erosion, and condition of apexior; calibrate pressure

gauge; inspect and repair insulation; clean, repack, and lubricate valve; reinstall manhole cover with new gasket; and inspect condition of all safety devices.

(5) Overhaul Deaerator Tank. Drain deaerator tank; remove manhole cover; wash and dry tank interior; inspect for corrosion, erosion, and condition of apexior protective coating; inspect internal piping and support; remove anode; inspect condition of anode and replace; clean and recoat interior of tank with apexior; calibrate pressure gauge; inspect and repair insulation; clean, repack, and lubricate valve; clean gauge glass; and reinstall manhole.

(6) Overhaul Valve. Operate valve to assure proper operation; inspect for rust and corrosion; inspect, clean, and lubricate valve stem; repack; clean and repair; repair valve and pipe insulation; adjust pipe hangar and supports; and inspect pipe hangar.

(7) Overhaul Gas System Valve. Disassemble gas cock valve; inspect for wear, rust, and corrosion; clean, lubricate, reassemble, and inspect for leakage.

(8) Overhaul Chemical Feed System. Inspect and clean the check valve and strainer; and inspect piping for blockage.

(9) Overhaul Water Softener. Regenerate water softener; clean, lubricate, and repack valve; inspect for leakage and corrosion; and inspect condition and depth of zeolite bed.

(10) Overhaul Forced Draft Fan. Clean, inspect, and lubricate shaft bearings, damper, and linkages; inspect fan blades, foundation, tightness of bearing, and foundation bolts; coupling; and check alignment of shaft and coupling.

(11) Overhaul Fuel Oil Heater. Clean suction and discharge strainer; repack fuel circulating pump shaft; clean, repack, and lubricate valve; repair and calibrate gauge; pressure test system; inspect for leakage; and set pressure relief valve.

(12) Overhaul Coal Stoker. Clean, inspect, repair, or replace parts; lubricate moving part; coat with rust preventative.

g. Install Plant Equipment. Perform initial installation of equipment making necessary connections of new unit to water, electrical, and fuel source.

(1) Install Equipment. Perform initial installation of equipment by putting in place and securing.

(2) Connect Equipment. Make connections of new unit to water, electrical, and fuel source.

h. Remove Plant Equipment

(1) Remove Equipment. Remove equipment from platform, stand, or bracket.

(2) Disconnect Equipment. Disconnect equipment from water, electrical, and fuel source.

i. Prepare for Boiler Inspection. Clean and open boiler for inspection.

2. Manned High Temperature Hot Water (HTHW) and Medium Temperature Hot Water (MTHW) Heating Plant

a. Operate Manned Heating Plant. Inspect, operate, and provide surveillance of all coal, oil, and gas fired heating plant equipment.

(1) Inspect Equipment. Perform inspection of equipment to ensure proper operation and to determine if maintenance is required.

(a) Inspect Boiler and Valve. Inspect handhole gasket, blowdown valve, fire box for internal or external leakage, safety valves for leakage, and header valve for packing, corrosion on stem, flange gasket, and leakage.

(b) Inspect Upper and Lower Soot Blower. Inspect for overheating, and check gears and oil level.

(c) Inspect Boiler Oil Positioning Valve. Inspect for leakage and check packing.

(d) Inspect Boiler Gas Positioning Valve. Inspect for leakage, corrosion, and freeness of valve.

(e) Inspect Oil Bypass Valve. Inspect for leakage and check padding.

(f) Inspect Gas Pilot and Oil Line Solenoid Valve. Inspect for leakage and corrosion.

(g) Inspect MTHW Pump. Inspect for leakage and check bearing, grease, oil, and cleanliness of pump and motor.

(h) Inspect MTHW Normal and Emergency Wake-Up Pump. Inspect for leakage and check packing and oil.

(i) Inspect Chemical Pump. Inspect for leakage; check packing, valves, grease, and oil.

(j) Inspect Deaerator Tank. Inspect for leakage, and check for cleanliness and for dissolved oxygen.

(k) Inspect Deaerator Tank Level Control-Filling Valve. Inspect for leakage and corrosion, and check packing.

(l) Inspect Deaerator Tank Heater Coil Regulator Valve and Automatic Blowdown. Inspect for leakage.

(m) Inspect Deaerator Tank Relief Valve. Inspect for leakage and check valve seating.

(n) Inspect Boiler Circulating Pump. Inspect for leakage and overheating; and check bearings, cooling water, oil, and freeness of shaft.

(o) Inspect Motorized Valve. Inspect for leakage and corrosion, and check packing.

(p) Inspect Pneumatic Mixing Valve. Inspect for leakage and corrosion, and check air pressure and packing.

(q) Inspect Check Valve. Inspect for leakage.

(r) Inspect High Temperature Hot Water (HTHW) Expansion Tank. Inspect for leakage and check manhole gaskets.

(s) Inspect Water Level Glass and Shut-Off Valve. Inspect for leakage and check packing.

(t) Inspect Valve to and Water Column. Inspect for leakage and check packing.

(u) Inspect Automatic and/or Manual Blowdown Line and Valve. Inspect for leakage and corrosion, and check packing.

(v) Inspect HTHW Expansion Tank Relief Valve. Inspect for leakage, corrosion, and blockage; and check valve seating.

(w) Inspect Safety Shut-Off Gas Valve. Inspect for leakage and corrosion, and check for freeness of valve.

(x) Inspect Combination Oil-Gas Burner. Inspect for leakage, and check tubing and freeness of louvers.

(y) Inspect Medium Temperature Hot Water (MTHW) to Oil Tank Motorized Valve. Inspect for leakage, corrosion, and check packing.

(z) Inspect Oil Heater Relief Valve. Inspect for leakage and check valve seating.

(aa) Inspect MTHW to Oil Heater Regulator. Inspect for leakage and check diaphragm.

(bb) Inspect Oil Pump. Inspect for leakage and overheating; and check shaft, bearing, and packing.

(cc) Inspect Oil Strainer. Inspect for leakage and cleanliness.

(dd) Inspect Oil Heater Check Valve. Inspect for leakage.

(ee) Inspect Heating and Ventilating (HV) Unit Control Valve. Inspect for leakage and check packing.

(ff) Inspect HV Unit. Inspect for overheating and proper operation, and check filter and belts.

(gg) Inspect Unit Heater. Inspect for leakage and check motor.

(hh) Inspect Air Compressor. Inspect for air leakage and overheating of motor; check oil level, shaft, bearings, pulleys, safety guard, filters, and belts; and test safety cock.

(ii) Inspect Water Softener. Inspect for leakage.

(jj) Inspect Soot Blower Line Air Valve. Inspect for leakage.

(kk) Inspect Air Line Filter. Inspect for leakage and check filter.

(ll) Inspect MTHW Tank. Inspect for leakage and check relief valve.

(mm) Inspect System Circulating Pump. Inspect for leakage and overheating; and check bearings, cooling water, and shaft.

(nn) Inspect MTHW Make-Up Pump. Inspect for leakage, and check water and bearings.

(oo) Inspect MTHW Converter Relief Valve. Inspect for leakage and blockage, and check valve seating.

(pp) Inspect MTHW Expansion Tank. Inspect for leakage and blockage; and check seating.

(qq) Inspect Piping. Inspect all piping and valves for leakage and corrosion; check packing, freeness of valves, and insulation of piping.

(rr) Inspect Coal Stoker. Inspect grate and grate shaking mechanism; check retort for warpage, burning or of slag; inspect damper for proper operation.

(2) Operate Equipment. Operate equipment to ensure optimum utilization.

(a) Perform Start-Up.

1 Perform Cold Boiler Start-Up.

2 Perform Standby Boiler Start-Up.

(b) Maintain Combustion. Maintain proper combustion by adjusting combustion controls and draft regulators.

(c) Operate ORSAT Analyzer. Operate ORSAT analyzer as required to check on proper combustion.

(d) Change Burner.

(e) Drain Receiver Tank.

(f) Switch Oil Tank Heater. Switch oil tank heater during oil operation.

(g) Perform Blowdown. Blowdown air lines, air filters, and receiver tanks.

(h) Add Water to System.

(i) Perform Shut-Down. Shutdown boiler per manufacturers' procedures.

(j) Perform Coal and Ash Handling

1 Operate Coal Handling Equipment. Operate coal handling equipment within the plant by releasing the necessary quantity of coal into each individual boiler storage feed bin.

2 Hand Shovel Coal. Hand shovel coal into stoker or boiler fire box.

3 Perform Ash Handling. Turn on vacuum system, open vacuum opening for the boiler from which the ashes and clinkers are being removed, open boiler ash box, and replace opening door.

4 Remove Ashes Manually. Remove boiler by shovel, load ashes into wheel barrow, and transport to outside dump area.

5 Provide Surveillance. Provide surveillance of heating plant equipment to ensure it is functioning properly and to meet safety requirements.

b. Perform Recurring Maintenance

(1) Clean Equipment. Perform periodic cleaning, remove foreign matter, and clean filter strainer.

(2) Lubricate Equipment. Perform periodic lubrication.

(3) Adjust Equipment. Perform periodic adjustments and tighten bolts.

(4) Perform Replacement. Replace filter and gasket.

(5) Provide Corrosion Control. Coat equipment to provide corrosion control.

(6) Change Oil. Change oil for components.

c. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction and to determine the type of repair necessary.

(2) Repair Equipment. Remove part or component deemed either reparable or replaceable, restore item removed to a usable condition, or replace item removed with a like item.

(3) Perform Tests. Run equipment through test cycle.

d. Perform Chemical Analysis and Water Treatment. Conduct boiler water concentration analysis and water treatment.

(1) Perform Boiler Water Concentration Analysis. Boiler water concentration analysis by collecting boiler water sample, prepare sample for shipment, and review analysis.

(a) Collect Boiler Water Sample. Collect sample of boiler water for analysis.

(b) Prepare Sample for Shipment. Prepare boiler water sample for shipment to EFD designated analysis point.

(c) Review Analysis. Review boiler water analysis to determine corrective action required.

(d) Perform Local Analysis. Collec sample of boiler water and perform local analysis.

(2) Perform Water Treatment. Add chemical to water to bring water to an acceptable level.

e. Maintain Instrumentation and Control

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction and to determine the type of repair necessary.

(2) Repair Equipment. Remove valve, switch, thermostat, regulator, and control panel deemed either reparable or replaceable; restore item removed to a usable condition, or replace item removed with like item.

(3) Calibrate Instrument and Control. Calibrate and adjust instrument and control to meet established tolerances and specifications.

(4) Perform Test. Run equipment through test cycle to ensure the malfunction has been corrected.

f. Perform Seasonal Overhaul. Perform seasonal overhaul of equipment and/or plant when system is shutdown.

(1) Overhaul Boiler Water Side. Remove handhole plate; remove screen and orifice; replace with new orifice; back flush tube and header; inspect boiler water side for scale, corrosion, erosion or abrasion; clean handhole plate; inspect for pitting; resurface plate; reinstall handhole plate with new gasket; and hydrostatically test boiler.

(2) Overhaul Boiler Fire Side. Remove boiler access door; open burner clean boiler fire side; inspect boiler tube for overheating and leakage; re-roll tube; clean fire box; inspect refractory for cracks, openings, and spalling of brick; clean inspection glass; and inspect pressure part for scale, corrosion, abrasion, and abnormal wear.

(3) Overhaul Boiler External Fittings. Inspect safety valve and escape pipe support; repair insulation; inspect thermometer, well, and sampling line; clean and adjust oil and gas burner; clean, inspect, and align soot blower; and repair and calibrate gauge.

(4) Overhaul MTHW Expansion Tank. Drain expansion tank; remove handhole plate; wash and dry tank interior; inspect for corrosion, erosion, and rust; inspect and repair insulation; clean, repack, and lubricate valve; clean gauge glass; and reinstall handhole plate with new gasket.

(5) Overhaul HTHW Expansion Tank. Drain expansion tank; remove manhole plate; wash and dry tank interior; inspect for corrosion, erosion, and condition of apexior protective coating; inspect internal piping and baffle; clean and coat

interior of tank with apexior; calibrate pressure gauge; inspect and repair insulation; clean, repack, and lubricate valve as required; reinstall manhole cover with new gasket; and inspect condition of all safety devices.

(6) Overhaul Deaerator Tank. Drain deaerator tank; remove manhole cover; wash and dry tank interior; inspect for erosion, and condition of apexior protective coating; inspect internal piping and support; remove anode; inspect condition of anode and replace; clean and recoat interior of tank with apexior; calibrate pressure gauge; inspect and repair insulation; clean, repack, and lubricate valve; clean gauge glass; and reinstall manhole.

(7) Overhaul Valve. Operate valve to assure proper operation; inspect for rust and corrosion; inspect, clean, and lubricate valve stem; repack; clean and repair; repair valve and pipe insulation; inspect and adjust pipe hangar and supports.

(8) Overhaul Gas System Valve. Disassemble gas cock valve; inspect for wear, rust, and corrosion; clean, lubricate, reassemble, and inspect for leakage.

(9) Overhaul HTHW and MTHW System. Inspect and clean check valve and strainer and calibrate gauge.

(10) Overhaul Chemical Feed System. Inspect and clean check valve and strainer and inspect piping for blockage.

(11) Overhaul Water Softner. Regenerate water softner; clean, lubricate, and repack valve; inspect for leakage and corrosion; and inspect condition and depth of zeolite bed.

(12) Overhaul Fuel Oil Heater. Clean suction and discharge strainer; repack fuel circulating pump shaft; clean, repack, and lubricate valve; repair and calibrate gauge; pressure test system; inspect for leakage; and set pressure relief valve.

(13) Overhaul Coal Stoker. Clean, inspect, repair, or replace parts; lubricate moving part; coat with rust preventive.

g. Install Plant Equipment. Perform initial installation of equipment, making necessary connections of new unit to water, electrical, and fuel source.

(1) Install Equipment. Perform initial installation of equipment making necessary connections of new unit to water, electrical, and fuel source.

(2) Connect Equipment. Make connections of new unit to water, electrical, and fuel source.

h. Remove Plant Equipment. Remove equipment; disconnect water, meter, electrical, and fuel source.

(1) Remove Equipment. Remove equipment from platforms, stands, or brackets.

(2) Disconnect Equipment. Disconnect equipment from water, electrical, and fuel source.

i. Prepare for Boiler Inspection. Clean and open boiler for inspection.

3. Unmanned Heating Plant

a. Operate Unmanned Heating Plant. Inspect, operate, and provide surveillance of all coal, oil, and gas fired heating plant equipment.

(1) Inspect Equipment. Perform inspection of equipment to ensure proper operation and to determine if maintenance is required.

(a) Inspect Boiler and Valve. Inspect handhole gasket, blowdown valve, fire box for internal or external leakage, safety valves for leakage, and header valve for packing, corrosion on stem, flange gasket, and leakage.

(b) Inspect Boiler and Valve. Inspect for leakage, and check packing.

(c) Inspect Boiler Gas Positioning Valve. Inspect for leakage, corrosion, and freeness of valve.

(d) Inspect Oil Bypass Valve. Inspect for leakage, and check padding.

(e) Inspect Gas Pilot and Oil Line Solenoid Valve. Inspect for leakage; and check bearings, grease, oil, and cleanliness of pump and motor.

(f) Inspect Water and Chemical Pump. Inspect for leakage; check packing, check valves, grease, and oil.

(g) Inspect Deaerator Tank. Inspect for leakage and, check for cleanliness and dissolved oxygen.

(h) Inspect Deaerator Tank Level Control-Filling. Inspect for leakage and corrosion, and check packing.

(i) Inspect Deaerator Tank Heater Coil Regulator Valve and Automatic Blowdown. Inspect for leakage.

(j) Inspect Deaerator Tank Relief Valve. Inspect for leakage and check valve seating.

(k) Inspect Boiler Circulating Pump. Inspect for leakage and check valve seating.

(l) Inspect Motorized Valve. Inspect for leakage and overheating; and check bearings, cooling rates, oil, and freeness of shaft.

(m) Inspect Pneumatic Mixing Valve. Inspect for leakage and corrosion, and check air pressure and packing.

(n) Inspect Check Valve. Inspect for leakage.

(o) Inspect Water Level Glass and Shut-off Valve. Inspect for leakage and check packing.

(p) Inspect Valve to and from Water Column. Inspect for leakage and check packing.

(q) Inspect Safety Shut-Off Gas Valve. Inspect for leakage and corrosion, and check for freeness of valve.

(r) Inspect Combination Oil-Gas Burner. Inspect for external leakage, and check flexible tubing and freeness of louvers.

(s) Inspect Gas Valve. Inspect for leakage and check packing.

(t) Inspect Force Draft Fan. Inspect fan blades and check bearings and lubrication.

(u) Inspect Oil Tank Motorized Valve. Inspect for leakage and corrosion, and check packing.

(v) Inspect Oil Heater Relief Valve. Inspect for leakage and check valve seating.

(w) Inspect Oil Heater Regulator. Inspect for leakage and check diaphragm.

(x) Inspect Oil Pump. Inspect for leakage and overheating; and check shaft, bearings, and packing.

(y) Inspect Oil Strainer. Inspect for leakage and cleanliness.

(z) Inspect Oil Heater Check Valve. Inspect for leakage.

(aa) Inspect Heating and Ventilating (HV) Unit Control Valve. Inspect for leakage and check packing.

(bb) Inspect HV Unit. Inspect for overheating and proper operation, and check filter and belts.

(cc) Inspect Unit Heater. Inspect for leakage and check motor.

(dd) Inspect Air Compressor. Inspect for air leakage and overheating of motor; and check oil level, shaft, bearings, pulleys, safety guard, filters, and belts.

(ee) Inspect Water Softener. Inspect for leakage.

(ff) Inspect Air Line Filter. Inspect for leakage and check filter.

(gg) Inspect System Circulating Pump. Inspect for leakage and overheating; and check bearings, cooling water, and freeness of shaft.

(hh) Inspect Make-Up Pump. Inspect for leakage and check bearings.

(ii) Inspect Converter Relief Valve. Inspect for leakage and blockage, and check valve seating.

(jj) Inspect Expansion Tank. Inspect for leakage and blockage, and check seating.

(kk) Inspect Piping. Inspect all piping and valves for leakage and corrosion; and check packing, freeness of valves, and insulation of piping.

(ll) Inspect Coal Fired Boiler. Inspect grates, combustion chamber, and damper.

(2) Operate Equipment. Operate equipment for the manufacture of heat, steam, and hot water, to ensure optimum utilization.

(a) Perform Start-Up. Perform boiler start-up by manufacturer's procedures.

1 Perform Cold Boiler Start Up.

2 Perform Standby Boiler Start Up.

(b) Maintain Combustion. Maintain proper combustion for optimum operation of equipment.

(c) Operate ORSAT Analyzer. Operate ORSAT analyzer to ensure proper combustion.

(d) Change Burner.

(e) Drain Receiver Tank.

(f) Switch Oil Tank Heater. Switch oil tank heater during oil operation.

(g) Perform Blowdown. Blowdown air lines, air filters, and receiver tanks.

(h) Add Water to System.

(i) Perform Coal and Ash Handling.

1 Operate Coal Handling Equipment. Operate coal handling equipment within the plant by releasing the necessary quantity of coal into each individual boiler storage feed bin.

2 Hand Shovel Coal. Hand shovel coal into boiler stoker or boiler fire box.

3 Perform Ash Handling. Turn on vacuum system, open vacuum opening for the boiler from which the ashes and clinkers are being removed, open boiler ash box, and replace vacuum opening door.

4 Remove Ashes Manually. Remove ashes from the boiler by shovel, load ashes into wheel barrow, and transport to outside dump area.

(j) Perform Shutdown. Shutdown boiler by manufacturer's procedures.

(3) Provide Surveillance. Provide surveillance of heating plant equipment to ensure it is functioning properly to meet safety requirements.

b. Perform Recurring Maintenance. Perform recurring maintenance on heating equipment or plant.

(1) Clean Equipment. Perform periodic cleaning, remove foreign matter, and clean filter strainer.

(2) Lubricate Equipment. Perform periodic lubrication.

(3) Adjust Equipment. Perform periodic adjustment and tighten bolts.

(4) Replace Replacement. Replace filter and gasket.

(5) Provide Corrosion Control. Coat equipment to provide corrosion control.

(6) Change Oil. Change oil for components.

c. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction and to determine the type of repair necessary.

(2) Repair Equipment. Remove part or component deemed either reparable or replaceable, restore item removed to a usable condition, or replace item removed with a like item.

(3) Perform Tests. Run equipment through test cycle.

d. Perform Chemical Analysis and Water Treatment. Conduct boiler water concentration analysis and water treatment.

(1) Perform Boiler Water Concentration Analysis. Conduct boiler water concentration analysis by collecting boiler sample; prepare sample for shipment and review analysis.

(a) Collect Boiler Water Sample. Collect sample of boiler water for analysis.

(b) Prepare Sample for Shipment. Prepare boiler water sample for shipment to EFD designated analysis point.

(c) Review Analysis. Review boiler water analysis to determine corrective action required.

(d) Perform Local Analysis. Collect sample of boiler water and perform local analysis.

(2) Perform Water Treatment. Add chemical to water to bring water to an acceptable level.

e. Maintain Instrumentation and Control

(1) Troubleshoot System. Troubleshoot the system to isolate the part or component responsible for the malfunction, and to determine the type of repair necessary.

(2) Repair Equipment. Remove valve, switch, thermostat, regulator, and control panel deemed either reparable or replaceable; restore item removed to a usable condition, or replace item removed with like item.

(3) Calibrate Instrument and Control. Calibrate and adjust instrument and control to meet established tolerances and specifications.

(4) Perform Test. Run equipment through test cycle to ensure the malfunction has been corrected.

f. Perform Seasonal Overhaul. Perform seasonal overhaul of equipment or plant when system is shutdown.

(1) Overhaul Boiler Water Side. Remove handhole plate; remove screen and orifice; replace with new orifice; back flush tube and header; inspect boiler water side for scale, corrosion, erosion, or abrasion; clean handhole plate; inspect for pitting; resurface plate; reinstall handhole plate with new gasket; and hydrostatically test boiler.

(2) Overhaul Boiler Fire Side. Remove boiler access door; open burner; clean boiler fire side; inspect boiler tube for overheating and leakage; re-roll tube; clean fire box; inspect refractory for cracks, openings, and spalling of brick; clean inspection glass; and inspect pressure part for scale, corrosion, abrasion, and abnormal.

(3) Overhaul Boiler External Fittings. Inspect safety valve and escape pipe support; repair insulation; inspect thermometer, well, and sampling line; clean and adjust oil and gas burner; clean, inspect, and align soot blower; and repair and calibrate gauge.

(4) Overhaul Expansion Tank. Drain expansion tank; remove manhole plate; wash and dry tank interior; inspect for corrosion, erosion, and condition of apexior; calibrate pressure gauge; inspect and repair insulation; clean, repack, and lubricate valve, reinstall manhole cover with new gasket; and inspect condition of all safety devices.

(5) Overhaul Deaerator Tank. Drain deaerator tank; remove manhole cover; wash and dry tank interior; inspect for corrosion, erosion, and condition of apexior protective coating; inspect internal piping and support; remove anode; inspect condition of anode and replace; clean and recoat interior of tank with apexior; calibrate pressur gauge; inspect and repair insulation; clean, repack, and lubricate valve; clean gauge glass; and reinstall manhole.

(6) Overhaul Valve. Operate valve to assure proper operation; inspect for rust and corrosion; inspect, clean, and lubricate valve stem; repack; clean and repair; repair valve and pipe insulation; and adjust and inspect pipe hangar and supports.

(7) Overhaul Gas System Valve. Disassemble gas cock valve; inspect for wear, rust, and corrosion; clean, lubricate, reassemble, and inspect for leakage.

(8) Overhaul Chemical Feed System. Inspect and clean, check valve and strainer, and inspect piping for blockage.

(9) Overhaul Water Softener. Regenerate water softener; clean, lubricate, and repack valve; inspect for leakage and corrosion; and inspect condition and depth of zeolite bed.

(10) Overhaul Forced Draft Fan. Clean, inspect, and lubricate shaft bearings, damper, and linkages; inspect fan blades, foundation, tightness of bearing, and foundation bolts; inspect coupling; and check alignment of shaft and coupling.

(11) Overhaul Fuel Oil Heater. Clean suction and discharge strainer; repack fuel circulating pump shaft; clean, repack, and lubricate valve; repair and calibrate gauge; pressure test system; inspect for leakage; and set pressure relief valve.

(12) Overhaul Coal Fired Boiler. Repair or replace defective part, clean and lubricate component parts, and coat them with rust preventive.

g. Install Plant Equipment. Perform initial installation of equipment, making necessary connections of new unit to water, electrical, and fuel source.

(1) Install Equipment. Perform initial installation of equipment by putting in place and securing with bolts or hangars.

(2) Connect Equipment. Make connections of new unit to water, electrical, and fuel source.

h. Remove Plant Equipment. Remove equipment; disconnect water, electrical, and fuel source.

(1) Remove Equipment. Remove equipment from platforms, stands, or brackets.

(2) Disconnect Equipment. Disconnect equipment from water, electrical, and fuel source.

i. Prepare for Boiler Inspection. Clean and open boiler for inspection.

4. Distribution Systems Associated with Manned or Unmanned Heating Plant

a. Operate System. Ensure all valves, strainers, and piping are in proper operating condition; inspect for leakage and determine if repairs are required.

b. Perform Recurring Maintenance. Perform required maintenance on distribution system and related equipment.

(1) Maintain Valve. Check operating condition of each valve, ensure warm-up loop valve is cracked open, inspect valve packing gland, clean and lubricate valve stem, inspect valve for leakage, adjust packing gland, add packing or repack valve, inspect for rust, clean and paint valve, and inspect valve insulation.

(2) Maintain Casing. Perform required air pressure test of buried casing.

(3) Maintain Piping. Replace, repair, or paint piping to provide corrosion control and color coding; perform lagging and pipe covering.

(4) Maintain Heat Exchanger. Check condition of heat exchangers; and clean, repair, or replace.

(5) Maintain Steam Trap. Check condition of, replace, and size trap.

(6) Maintain Condensate Pump. Inspect and clean strainer and receiver tank, check float and vacuum control, and inspect for leakage and corrosion.

c. Perform Nonrecurring Maintenance. Perform nonrecurring maintenance on distribution system.

d. Install Equipment. Plan and make initial placement of heating equipment to include connecting water, fuel, electrical sources, and installing pipe hangars.

e. Remove Equipment. Permanently remove heating distribution equipment to include disconnecting water, fuel, electrical sources, and removing pipe hangars.

C. ELECTRICAL DISTRIBUTION SYSTEMS

1. Substation

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make necessary connections and adjustments.

(a) Install Conductor.

(b) Install Transformer.

(c) Install Insulator.

(d) Install Voltage Regulator.

(e) Install Disconnect Switch.

(f) Install Circuit Breaker.

(g) Install Control.

(h) Install Instrument.

(2) Test System. Perform an operational test of the system into which a new component has been installed.

(3) Perform Load Check. Perform a current and voltage load check after installation of a new component.

(4) Complete Record. Prepare all forms and records associated with the installation of a new component.

(5) Perform Cleanup. Return the area to a state of cleanliness equal to that which existed when the job began.

b. Perform Nonrecurring Maintenance

(1) Test System. Perform a test of the system to ensure proper operation after a repair has been made.

(2) Perform Load Check. Perform a current and voltage load check after a repair has been made.

(3) Complete Record. Prepare all forms and records associated with the repair action.

(4) Perform Cleanup. Return the area to a state of cleanliness equal to that which existed when the job began.

c. Perform Recurring Maintenance

(1) Inspect System. Perform visual inspection of the substation and related system components.

(2) Test System. Perform a functional test of those systems within the substation which can be tested independently.

(3) Clean Components. Remove all foreign material such as dirt, dust, oil, or grease from any component within the substation.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required, to any component or part within the substation.

(5) Filter Oil. Filter the oil in oil circuit breaker or line voltage regulator.

(6) Adjust Equipment. Adjust equipment within the substation and tighten any loose connections or bolts.

(7) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating as required.

(8) Perform Load Check. Perform a current and voltage load check.

(9) Take Meter Readings. Take and record substation meter readings.

(10) Cut Grass. Cut the grass within the confines of the substation.

(11) Make Repairs. Correct any discrepancy found during the inspection.

d. Operate Substation. Perform necessary operations at substations to equalize loads and ensure sufficient power output.

2. Switching Station

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make necessary connections and adjustments.

(a) Install Conductor.

(b) Install Insulator.

(c) Install Voltage Regulator.

(d) Install Disconnect Switch.

(e) Install Circuit Breaker.

(f) Install Control.

(g) Install Instrument.

(2) Test System. Perform an operational test of the system into which a new component has been installed.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction and to determine the type of repair necessary.

(2) Make Job-Site Repair. Restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Replace Conductor.

(b) Replace Insulator.

(c) Replace Voltage Regulator.

(d) Replace Disconnect Switch.

(e) Replace Circuit Breaker.

(f) Replace Control.

(g) Replace Instrument.

c. Perform Recurring Maintenance

(1) Inspect System. Perform a visual inspection of the switching station and related system components.

(2) Test System. Perform a test of those systems which can be tested independently.

(3) Clean Components. Remove all foreign material such as dirt, dust, oil, or grease from any component within the switching station.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required to any component or part within the switching station.

(5) Filter Oil. Filter the oil in oil circuit breaker or line voltage regulator.

(6) Adjust Equipment. Adjust equipment within the switching station and tighten any loose connections or bolts.

(7) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating as required.

(8) Cut Grass. Cut the grass within the confines of the substation.

(9) Make Repairs. Correct any discrepancy found during the inspection.

d. Operate Switching Station. Perform necessary operations at substations to equalize loads and ensure sufficient power output.

3. Electrical Vault

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make all necessary connections and adjustments.

(a) Install Distribution Transformer.

(b) Install Current Regulator.

(c) Install Oil Circuit Breaker.

(d) Install Insulator.

(e) Install Switching Gear.

(f) Install Control Circuit.

(2) Test System. Perform an operational test of the system into which a new component has been installed.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction and to determine the type of repair necessary.

(2) Make Job-Site Repair. Restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Repair Distribution Transformer.

(b) Repair Current Regulator.

(c) Repair Oil Circuit Breaker.

(d) Repair Insulator.

(e) Repair Switching Gear.

(f) Repair Control Circuit.

c. Perform Recurring Maintenance

(1) Inspect System. Perform a visual inspection of the overhead distribution station and related system components.

(2) Test System. Perform a test of those systems which can be tested independently.

(3) Clean Components. Remove all foreign material such as dirt, dust, oil, or grease from any component within the system.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required to any component or part within the system.

(5) Adjust Component. Adjust equipment within the switching station and tighten any loose connections or bolts.

(6) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating as required.

(7) Make Repairs. Correct any discrepancy found during inspection.

(8) Trim Tree. Trim tree located near overhead power distribution lines.

4. Overhead Distribution System

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make all necessary connections and adjustments.

(a) Install Cable.

(b) Install Pothead.

(c) Install Transformer.

(d) Install Cable Box.

(e) Install Oil Fuse Cutout.

(f) Install Load Limiter.

(g) Install Disconnect Switch.

(2) Test System. Perform an operational test of the system into which a new component has been installed.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction and to determine the type of repair necessary.

(2) Make Job-Site Repair. Restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Repair Overhead Conductor.

(b) Repair Pole.

(c) Repair Distribution Transformer.

(d) Repair Crossarm.

(e) Repair Insulator.

(f) Repair Voltage Regulator.

(g) Repair Disconnect Switch.

(h) Repair Pothead.

c. Perform Recurring Maintenance

(1) Inspect System. Perform a visual inspection of the overhead distribution station and related system components.

(2) Test System. Perform a test of those systems which can be tested independently.

(3) Clean Components. Remove all foreign material such as, dirt, dust, oil, or grease from any component within the system.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required, to any component or part within the system.

(5) Adjust Component. Adjust equipment within the system and tighten any loose connections or bolts.

(6) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating, as required.

(7) Make Repairs. Correct any discrepancy found during the inspection.

(8) Trim Tree. Trim tree located near overhead power distribution lines.

5. Underground Distribution System

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make all necessary connections and adjustments.

(a) Install Cable.

(b) Install Pothead.

(c) Install Transformer.

(d) Install Cable Box.

(e) Install Oil Fuse Cutout.

(f) Install Load Limiter.

(g) Install Circuit Breaker.

(h) Install Control.

(i) Install Instrument.

(2) Test System. Perform a functional test of the system to ensure proper operation.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction, and to determine the type of repair necessary.

(2) Make Job-Site Repair. Restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Repair Energized Cable.

(b) Repair De-energized Cable.

(c) Repair Pothead.

(d) Repair Transformer.

(e) Repair Cable Box.

(f) Repair Oil Fuse Cutout.

(g) Repair Load Limiter.

(h) Repair Circuit Breaker.

(i) Repair Control.

(j) Repair Instrument.

c. Perform Recurring Maintenance

(1) Inspect System. Perform a visual inspection of the traffic control system and related components.

(2) System. Perform a functional test of those systems which can be tested independently.

(3) Clean Components. Remove all foreign material such as dirt, dust, oil, or grease from any component within the system.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required, to any component within the system.

(5) Adjust Component. Adjust any piece of equipment within the system and tighten all loose connections and bolts.

(6) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating, as required.

(7) Pump Out Manhole. Pump out and clean manhole.

(8) Make Repairs. Correct any discrepancy found during the inspection.

6. Street Lighting

a. Install Equipment

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make all necessary connections and adjustments.

(a) Install Pole.

(b) Install Lighting Fixture.

(c) Install Wire.

(d) Install Insulator.

(e) Install Control.

(2) Test System. Perform a test of the system to ensure proper operation of a newly installed light or series of lights.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction and to determine the type of repair necessary.

(2) Make Repair. Repair, replace, or restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Repair Pole.

(b) Repair Lighting Fixture.

(c) Repair Wire.

(d) Repair Insulator.

(e) Repair Control.

(3) Test System. Perform test of the system to ensure proper operation after a repair has been made.

c. Perform Recurring Maintenance

(1) inspect System. Perform a visual inspection of the base street lighting system.

(2) Test System. Perform a functional test of the system.

(3) Clean Component. Remove all foreign material such as dirt, oil, dust, or grease from any system component.

(4) Adjust Equipment. Adjust any equipment in the system and tighten any loose connections.

(5) Perform Corrosion Control. Remove any corrosion found in the system and apply protective coating as required.

(6) Make Repair. Correct any discrepancy found during the inspection.

d. Relamp Fixture. Remove and replace burned out lamp or globe.

7. Floodlight and Parking Lot Light

a. Install Equipment.

(1) Make Initial Placement. Install equipment in specified location, fasten in place, and make all necessary connections and adjustments.

(a) Install Pole.

(b) Install Conductor.

(c) Install Control.

(d) Install Instrument.

(e) Install Transformer

(f) Install Voltage Regulator.

(g) Install Fixture.

(2) Test System. Perform a test of the system to ensure proper operation.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot System. Troubleshoot the system to isolate the component or part responsible for the malfunction and to determine the type of repair necessary.

(2) Make Job-Site Repair. Restore to a usable condition damaged, worn, or malfunctioning equipment, part, or assembly.

(a) Repair Pole.

(b) Conductor.

(c) Repair Control.

(d) Repair Instrument.

(e) Repair Transformer.

(f) Repair Voltage Regulator.

(g) Repair Fixture.

c. Perform Recurring Maintenance

(1) Inspect System. Perform a visual inspection of the distribution system and related components in support of the floodlighting system.

(2) Test System. Perform a functional test of the system to ensure proper operation.

(3) Clean Components. Remove all foreign material such as, dirt, dust, oil, or grease from any component within the system.

(4) Lubricate Equipment. Apply oil, grease, or other lubricant as required to any system component.

(5) Adjust Component. Adjust equipment within the system and tighten any loose components.

(6) Perform Corrosion Control. Remove any corrosion found on a piece of equipment and apply protective coating as required.

(7) Make Repair. Correct any discrepancy found during the inspection.

d. Relamp Fixture. Remove and replace burned out lamp or globe.

D. WATER AND SEWER SYSTEMS

1. Water Well

a. Install Water Well Component. Preassemble equipment and perform initial installation of all well components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Well Assembly.

(2) Install Driving Equipment.

(3) Install Pump.

(4) Install Motor.

(5) Install Standby Engine.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the well component to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assemble without removing it from its position at the well.

(a) Repair Well Assembly.

(b) Repair Driving Equipment.

(c) Repair Pump.

(3) Overhaul Component. Disassemble the component; repair or replace worn or damaged parts; adjust, clean, and lubricate all moving parts; and reassemble the component.

(a) Overhaul Well Assembly.

(b) Overhaul Driving Equipment.

(c) Overhaul Pump.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's, specifications and correct all minor discrepancies which are found.

(1) Measure Water Level and Drawdown. Measure the static level, pumping level, and drawdown from each well.

(2) Record Water Level and Drawdown. Record the static level, pumping level, and drawdown from each well.

(3) Check for Safe Pumping Yield. Review daily and monthly records to determine if the quantity of water pumped is exceeding the safe yield of the well.

(4) Clean Well Screen. Clean well screen using an approved method.

(5) Inspect Sanitary Condition. Check surface drainage, well apron, top of well casing, vent, priming and lubricating water, and well pit for proper sanitary conditions.

(6) Check Water Sample Tap. Ensure that a water sample tap is installed in the discharge line near the pump and faces downward.

(7) Check Cooling Water. Ensure that water for cooling parts of engines, air compressors, pumps, and other equipment is not returned to any part of the water system.

(8) Check Air-Lift System. Ensure that air is discharged into storage tank, clean filter, ensure air intake is properly protected, blowout storage tank line, and drain off collected oil and moisture.

(9) Check Nearby Well. Ensure that all observation wells and abandoned wells located near the pumping well are properly capped and watertight.

(10) Lubricate Pump Bearing. Apply proper lubricant to all pump bearings.

(11) Adjust Impeller. Check impeller for maximum efficiency setting and adjust.

(12) Examine Bowl and Water Passage. Check for pitting, wear, and corrosion on bowl and water passage.

(13) Examine Shaft Sleeve. Examine shaft sleeve, packing assembly, and repack.

(14) Check Alignment. Ensure that shaft, pump head, and motor are properly aligned.

(15) Paint Pump. Apply an effective protective coating on the exterior of the pump and, if practical, on interior parts which are subject to rust.

2. Pumping Station

a. Install Pumping Station Component. Preassemble equipment and perform initial installation of all pumping station components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Pump.

(2) Install Motor.

(3) Install Standby Engine.

(4) Install Driving Equipment.

(5) Install Chemical Feeder.

(6) Install Exhaust Fan.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the malfunction to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assemble without removing it from the pump station.

(a) Repair Pump.

(b) Repair Driving Equipment.

(c) Repair Chemical Feeder.

(d) Repair Exhaust Fan.

(3) Overhaul Component. Disassemble the component; repair or replace worn or damaged parts; adjust, clean, and lubricate all moving parts; and reassemble the component.

(a) Overhaul Pump.

(b) Overhaul Driving Equipment.

(c) Overhaul Chemical Feeder.

(d) Overhaul Exhaust Fan.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's specifications, and correct all minor discrepancies which are found.

(1) Inspect Driving Equipment. Service combustion engines; check electric motors; and inspect coupling, drives, and bearings.

(2) Check Operating Condition. Check bearing, temperature, and lubrication; note readings of suction and discharge pressure gauge; ensure all valves are properly set and screens are not clogged; examine packing; observe rate of flow; check readings of instruments and meters on pump motor and note direction of rotation.

(3) Check Ring. Check all wearing or sealing rings for proper wearing clearance.

(4) Lubricate Bearing. Apply proper lubricant to all pump bearings.

(5) Adjust Impeller. Check impeller for maximum efficiency setting and adjust.

(6) Examine Bowl and Water Passage. Check for pitting, wear, and corrosion on bowl and water passage.

(7) Examine Shaft Sleeve. Examine shaft sleeve, packing assembly, and repack.

(8) Check Alignment. Ensure that shaft, pump head, and motor are properly aligned.

(9) Check Pump Jack. Check pump jack for proper lubrication, alignment, and corrosion.

(10) Check Pump Delivery. Measure output for proper pump delivery.

(11) Alternate Pump Operation. Alternate pump operation if two or more pumps are installed.

(12) Check Accessory and Belt. Check and adjust loose connection, linkage, and mounting of accessory.

(13) Inspect Electrical Wiring. Check connection, insulation for cracking or chafing, and check conduit and shielding for dryness. Report any unserviceable wiring.

(14) Inspect for Leak. Examine all piping, valves, and fittings for leaks.

(15) Recharge Chemical Feeder. Recharge chemical feeder and adjust injector and pressure regulator to ensure that proper amount of chlorine or other chemicals are being injected into the water.

3. Water Storage System

a. Install Storage System Component. Preassemble equipment and perform initial connections and adjustments, and check for proper operation.

(1) Install Reservoir.

(2) Install Storage Tank.

(3) Install Standpipe.

(4) Install Gate Assembly.

(5) Install Valve.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the storage system components to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restor to a usable condition any damaged, worn, or malfunctioning component, part, or assemble without removing it from its position.

(a) Repair Reservoir.

(b) Repair Storage Tank.

(c) Repair Standpipe.

(d) Repair Gate Assembly.

(e) Repair Valve.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's specifications and correct all minor discrepancies which are found.

(1) Check Water Level. Check the water level in reservoir, storage tank, and standpipe.

(2) Check Condition. Check remote regulator, water level control, and indicator for proper operation.

(3) Adjust Control. Adjust altitude valve, regulator, and distribution pump mode for desired minimum levels.

(a) Adjust Remote Method. Adjust storage system control in the treatment plant or other central location.

(b) Adjust On-Site Method. Adjust storage system control at the actual storage location.

(4) Perform Inspection. Perform freezing and corrosion control inspection of storage tank, reservoir, standpipe, valve, and fitting.

(5) Operate Fire Pump. Operate pump and recirculate tank contents as frequently as required to prevent or reduce ice formation when storage tank is used for fire protection only.

(6) Check for Leaks. Check the cover and walls of reservoir frequently for leaks that permit the entrance of surface water or shallow ground water and repair leaks immediately.

(7) Inspect Reservoir. Inspect sides and the bottom of the reservoir and maintain free from vegetation and debris.

(8) Inspect Intake. Make periodic inspection on intake and report any cracks or other structural defects. Keep screen and rack clean and in good condition.

(9) Check General Condition. Check tank for loose scale, leaky seams, rivets, condition of ladder, condition of roof, structural forms, and condition of paint.

(10) Examine Sway Bracing. Check for tautness and tighten turnbuckles if necessary.

(11) Inspect Tank Foundation. Inspect tank foundation for deterioration and repair.

(12) Check Cathodic Protection System. Check the operation and effectiveness of the equipment.

(13) Check Heating System. Prior to freezing weather, inspect insulation; seal opening; inspect elements of the system; clean, and operate the system to check condition of elements in operation.

4. Water Treatment Plant

a. Install Plant Component. Preassemble equipment and perform initial installation of all pumping station components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Clarifier.

(2) Install Chlorinator.

(3) Install Ammoniator.

(4) Install Fluoridator.

(5) Install Pump.

(6) Install Motor.

(7) Install Standby Engine.

(8) Install Driving Equipment.

(9) Install Meter or Recorder.

(10) Install Valve.

(11) Install Aerator.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the treatment plant components to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assemble without removing it from the pump station.

(a) Repair Clarifier.

(b) Remove Chlorinator.

(c) Repair Ammoniator.

(d) Repair Fluoridator.

(e) Repair Pump.

(f) Repair Driving Equipment.

(g) Repair Meter or Recorder.

(h) Repair Valve.

(i) Repair Generator.

(3) Overhaul Component. Disassemble the component; repair or replace worn or damaged parts; adjust, clean, and lubricate all moving parts and reassemble the component.

(a) Overhaul Clarifier.

(b) Overhaul Chlorinator.

(c) Overhaul Ammoniator

(d) Overhaul Fluoridator.

(e) Overhaul Pump.

(f) Overhaul Driving Equipment.

(g) Overhaul Meter or Recorder.

(h) Overhaul Valve.

(i) Overhaul Aerator.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and manufacturer's specifications and correct all minor discrepancies which are found.

(1) Operate Pump. Start and stop pumps as required to satisfy demand and to maintain proper level and pressure.

(2) Recharge Chemical Feeder. Recharge chemical feeder and adjust injector and pressure regulator to ensure that proper amount of chemicals are being injected into the water.

(a) Operate Chlorinator.

(b) Operate Ammoniator.

(c) Operate Fluoridator.

(3) Operate Clarification Equipment. Periodically sample flocculator output, check appearance of effluent, and adjust clarification equipment to ensure proper clarity.

(4) Check Emergency Equipment. Check all emergency and standby equipment in the treatment plant.

(a) Check Pump.

(b) Check Motor.

(c) Check Standby Engine.

(5) Maintain Filters. Operate, adjust, and backwash iron removal, sand, and other filters.

(6) Store Chemical. Store gaseous chlorine or other chemicals in a safe manner.

(7) Maintain Operating Record. Take regular readings on meter, gauge, and other indicating device; record information; analyze record and log; and prepare and submit utility to all agencies both on- and off-base.

(8) Inspect Driving Equipment. Service combustion engine; check electric motor; and inspect coupling, drive, and bearing.

(9) Check Operating Condition. Check bearing temperature and lubrication, suction and discharge pressure gauge, valve setting and screens packing, rate of flow, readings of instruments and meters on pump motor, and note direction of rotation.

(10) Check Rings. Check all wearing or sealing rings for proper wearing clearances.

(11) Adjust Impeller. Check impeller for maximum efficiency setting and adjust.

(12) Examine Shaft Sleeve. Examine shaft sleeve and packings and repack.

(13) Check Alignment. Check that shafts, pump heads, and motor are properly aligned.

(14) Check Accessory and Belt. Check and adjust loose connection, and linkage, and mounting of accessory.

(15) Inspect Electrical Wiring. Check all connections, inspect insulation for cracking or chafing, and check conduit and shielding for dryness.

(16) Inspect for Leak. Examine all piping, valves, and fittings for leaks.

(17) Check Calibration. Check instrument calibration by comparing level indication against known level or by comparing recorded or indicated flow against volumetric displacement on a basin or elevated tank.

(18) Inspect and Service Valve. Record error in location ties, note whether valve is found open or closed, check operation, check and lubricate packing; check for bent stem; check operating nut, check bypass; and check and lubricate gears.

5. Water Softener

a. Install Water Softer Component. Preassemble equipment and perform initial installation of all water softening components. Make all necessary connections, and adjustments and check for proper installation and operation.

(1) Install Brine Measuring Tank.

(2) Install Softener Unit.

(3) Install Salt Storage Tank.

(4) Install Ejector.

(5) Install Valve.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the softening component to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assemble.

(a) Repair Brine Measuring Tank.

(b) Repair Softener Unit.

(c) Repair Ejector.

(d) Repair Valve.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's specifications and correct all minor discrepancies which are found.

(1) Remove Excess Zeolite Fine. Remove excess zeolite fines by scraping off surface and adding make-up zeolite when necessary.

(2) Inspect Water and Brine Distribution Fitting. Test water and brine distribution fittings and check for obstructions, corrosion, and security.

(3) Paint Softener Unit. Brush and clean exterior of unit and paint to protect against corrosion.

(4) Check Brine Solution. Check strength of brine solution delivered to ejector and make any adjustment necessary to reach desired strength.

(5) Clean Storage Tank. Clean salt storage tank at interval determined by kind of salt used, amount of insolubles in it, size of tank, and amounts used in a given time.

(6) Paint Brine Measuring Tank. Clean, wirebrush, and paint both interior and exterior of brine measuring tank to protect against corrosion.

(7) Inspect Ejector. Inspect and clean ejector. Disassemble and examine for wear and erosion. Clean clogged piping.

(8) Inspect for Valve Leak. Inspect each individual valve for leak. Lubricate and repack.

(9) Check Service Condition. Determine softening capacity, check flow rate; check backwash rate, check flow rate for rinsing, pressure, and calculate efficiency.

(10) Inspect Zeolite Surface. Check elevation, appearance, and cleanliness of zeolite surface and take whatever corrective actions are necessary.

(11) Maintain Zeolite Bed Depth. Add zeolite to maintain original bed depth and softening capacity.

(12) Regenerate Zeolite Bed. Drain, rinse, backwash, and regenerate zeolite bed.

(13) Inspect Interior of Underdrain. Inspect manifold type of underdrain system.

(14) Replace Zeolite. Replace zeolite when determined necessary by inspection or service-condition check.

(15) Inspect Gravel. Inspect gravel bed and replace gravel.

(16) Adjust Control. Adjust valve and regulator associated with the softener.

(17) Maintain Operating Record. Take regular readings from meter, gauge, and other indicating devices; record information; periodically analyze records and logs; and prepare and submit utility operations reports to all appropriate agencies both on- and off-base.

6. Water Demineralizer

a. Install Water Demineralizer Component. Preassemble equipment and perform initial installation of all demineralizer components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Mixer Tank.

(2) Install Filter.

(3) Install Driving Equipment.

(4) Install Pump.

(5) Install Valve.

(6) Install Meter or Recorder.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot the demineralizer component to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assembly. Overhaul if necessary.

(a) Repair Mixer Tank.

(b) Repair Filter.

(c) Repair Driving Equipment.

(d) Repair Pump.

(e) Repair Valve.

(f) Repair Meter or Recorder.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's specifications and correct all minor discrepancies which are found.

(1) Inspect Filter. Inspect and change protective filter cartridge.

(2) Check Chemical Supply. Check supply of sodium bisulfate and sulfuric acid and add make-up to required levels.

(3) Inspect Pump and Valve. Check pump and valve for leaks, and oil pump or repack valves.

(4) Inspect Membrane. Inspect and replace membrane assembly.

(5) Adjust Control. Adjust control to effect stage operation of cation and anion units.

(6) Store Chemical. Store chemical and acid in a safe manner.

(7) Maintain Operating Record. Take regular readings from meter, gauge, and other indicating device; record information; periodically analyze records and logs; and prepare and submit utility operations reports.

7. Sewage Lift Station

a. Install Lift Station Component. Preassemble equipment and perform initial installation of all lift station components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Pump.

(2) Install Motor.

(3) Install Driving Equipment.

(4) Install Regulator.

(5) Install Comminutor.

(6) Install Valve.

(7) Install Standby Engine.

(8) Install Ejector.

(9) Install Chemical Feeder.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot all components in the lift station to isolate the part or component responsible for the malfunction and to determine the type of repair necessary. Diagnose any unusual malfunction by interpreting pressure gauge, flow meter, liquid level indicator, thermometer, analytical test, and visual sign.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assembly. Overhaul if necessary.

(a) Repair Pump.

(b) Repair Driving Equipment.

(c) Repair Regulator.

(d) Repair Comminuted.

(e) Repair Valve.

(f) Repair Standby Engine.

(g) Repair Ejector.

(h) Repair Chemical Feeder.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and appropriate manufacturer's specifications and correct all minor discrepancies which are found.

(1) Inspect Driving Equipment. Inspect combustion engines, electric motor, couplings, drives, and bearings.

(2) Check Operating Condition. Check bearing temperatures and lubrication, note readings of suction and discharge pressure gauges, ensure all valves are properly set and screens are not clogged; examine packing, observe rate of flow, check readings of instruments and meters on pump motor, and note direction of rotation.

(3) Check Ring. Check all wearing or sealing rings for proper wearing clearance.

(4) Lubricate Bearing. Lubricant all pump bearings.

(5) Adjust Impeller. Adjust impeller for maximum efficiency setting.

(6) Examine Shaft Sleeve. Examine shaft sleeve and packing assembly and repack.

(7) Check Alignment. Check that shaft, pump head, and motor are properly aligned.

(8) Check Pump Delivery. Check output for proper pump delivery.

(9) Alternate Pump Operation. If two or more pumps are installed alternate their operation to equalize wear.

(10) Accessory and Belt. Check and adjust loose connection, linkage, and mounting of accessory.

(11) Inspect Electrical Wiring. Check connection; inspect insulation for cracking or chafing; and check conduit and shielding for dryness. Report any unserviceable wiring.

(12) Inspect for Leak. Inspect piping, valve, and fitting for leaks.

(13) Inspect Wet Well. Inspect wet well for accumulation of solids on sides and bottom and flush when necessary.

(14) Clean Screen. Clean bar and basket screens and grinders to prevent obstruction and overflow.

(15) Check Dry Well. Check dry well and water and pumps out.

8. Sanitary Waste Treatment Plant

a. Install Plant Component. Preassemble equipment and perform initial installation of all pumping station components. Make all necessary connections and adjustments and check for proper installation and operation.

(1) Install Grit Chamber.

(2) Install Comminutor.

(3) Install Flow Meter.

(4) Install Sedimentation Tank.

(5) Install Trickling Filter.

(6) Install Digester.

(7) Install Sludge Bed.

(8) Install Chlorinator.

(9) Install Aerator.

(10) Install Septic Tank.

(11) Install Grease Trop.

(12) Install Imhoff Tank.

(13) Install Pump.

(14) Install Motor.

(15) Install Standby Engine.

(16) Install Distributor.

(17) Install Clarifier.

(18) Install Barminuter.

b. Perform Nonrecurring Maintenance

(1) Troubleshoot and Diagnose Malfunction. Troubleshoot all plant components to isolate the part or component responsible for the malfunction interpreting pressure gauges, flow meters, liquid level indicators, thermometers, analytical tests, and visual signs.

(2) Make Job-Site Repair. Repair, adjust, replace, or restore to a usable condition any damaged, worn, or malfunctioning component, part, or assembly. Overhaul if necessary.

(a) Repair Orbit Chamber.

(b) Repair Communitor.

(c) Repair Flow Meter.

(d) Repair Sedimentation Tank.

(e) Repair Trickling Filter.

(f) Repair Digester.

(g) Repair Sludge Bed.

(h) Repair Chlorinator.

(i) Repair Aerator.

(j) Repair Septic Tank.

(k) Repair Grease Trap.

(l) Repair Imhoff Tank.

(m) Repair Pump.

(n) Repair Distributor.

(o) Repair Clarifier.

(p) Repair Barminuter.

c. Perform Recurring Maintenance. Perform all recurring maintenance tasks as outlined in applicable publications and manufacturer's specifications and correct all minor discrepancies which are found.

(1) Maintain Grit Chamber. Observe flow in influent through basin; remove large foreign objects, remove and dispose of grit; and flush basin.

(2) Maintain Flow Meter. Remove chart from meter, record data, file char, and place new chart on meter.

(3) Maintain Sedimentation Tank. Remove floating and fouling material, hose down channels and weirs, check and adjust moving parts, and add oil or grease.

(4) Check Trickling Filter. Inspect filter bed media; eliminate pooling through use of chemicals, water pressure, or rearranging bed media; check operation of the distribution; and lubricate.

(5) Maintain Digester. Check and adjust digester temperature, gas pressure, liquid level, and rate or recirculation; drain condensation from pipes; check for gas and water leaks; service gas system; and remove scum.

(6) Maintain Sludge Drying Bed. Remove dried sludge from bed, transfer to disposal site, and prepare bed for next sludge change.

(7) Maintain Oxidation Pond. Divert effluent from one pond to another and monitor the flow to ensure that no raw or digested sludge or supernatant liquid are discharged.

(8) Maintain Stabilization Lagoon. Check and adjust water level for proper containment of effluent and evaporation or infiltration action; break up surface scum; and add chemicals, as required, to control algae growth.

(9) Recharge Chemical Feeder. Recharge chemical feeder and adjust injector and pressure regulators to ensure proper amount of chemicals are being injected.

(10) Check Emergency Equipment. Periodically perform an operator check and operational check and operational test of all emergency and standby equipment in the plant.

(11) Operate Aeration Equipment. Observe air flow through the system; operate blower as required; and check operation of blower, air intake, and filters.

(12) Maintain Grease Trap. Skin grease and oil from trap inlet; clear outlet; pump or scoop settled solids from bottom; and dispose of grease trap waste.

(13) Maintain Septic Tank.

(a) Inspect Outflow. Inspect outflow from septic tank to ensure proper flow and condition, check inlet and outlet, and free from clogging, and check trickle beds for proper condition and outflow.

(b) Pump Out Solids. Pump out and dispose of solids in sanitary sewer or in shallow ground furrows.

(14) Operate IMHOFF Tank.

(a) Regulate Flow. Regulate the flow and ensure proper distribution of influent to the settling compartments.

(b) Clear Gas Vent. Breakup and remove scum from gas vents to allow entrapped gas to escape and floating matter to drop into the digestion chamber.

(c) Control Foaming. Ensure that foam does not overflow into settling tank by adding lime.

(d) Clean Tank. Skim grease, wash walks, wash exposed surfaces; squeegee sides of channels; and clean slot with chain.

(15) Maintain Filters. Operate, adjust, and backwash iron removal, sand, and other filters.

(16) Store Chemical. Store gaseous chlorine or other chemicals in a safe manner.

(17) Maintain Operating Record. Take regular readings from meter, gauge, and other indicating device; record information; analyze record and log; and prepare and submit utility operations report to all appropriate agencies both on- and off-base.

(18) Inspect Driving Equipment. Inspect combustion engine; electric motor, couplings, drives, and bearings.

(19) Check Operating Condition. Check bearing temperatures and lubrication, suction and discharge pressure guage; ensure valves are properly set, and screens are not clogged; check packing, rate of flow, reading of instruments and meters on pump motor, and note direction of rotation.

(20) Check Rings. Check all wearing or sealing rings for proper wearing clearances.

(21) Adjust Impeller. Adjust impeller for maximum efficiency setting.

(22) Examine Shaft Sleeve. Examine shaft sleeves and packings and repack.

(23) Check Alignment. Check that shafts, pump heads, and motor are properly aligned.

(24) Check Accessory and Belt. Check and adjust loose connections, linkage, or mountings of accessories.

(25) Inspect Electrical Wiring. Check all connections; inspect insulation for cracking or chafing, and check conduits and shielding for dryness. Report any unserviceable wiring.

(26) Inspect for Leaks. Examine all piping, valves, and fittings for leaks.

(27) Check Calibration. Check instrument calibration by comparing level indication against known level or by comparing recorded or indicated flow against volumetric displacement on a basin or elevated tank.

(28) Inspect and Service Valve. Record errors in location ties; note whether valve is found open or closed; check operation, check, and lubricate packing; check for bent stems check operating nut, bypass, and lubricate gears.

9. Sewage Laboratory

a. Install Laboratory Equipment. Preassemble equipment and components and make initial installation in sewage laboratory.

b. Operate Sewage Laboratory

(1) Sample Water. Obtain water as it leaves the plant and from various points of treatment throughout the plant.

(2) Prepare for Test. Prepare reagent, mix cleaning solution, and manufacture distilled water in sufficient quantities to conduct all tests for that day.

(3) Conduct Laboratory Test. Conduct one test for BOD, suspended solids, settleable solids, relative stability, temperature, Ph, dissolved oxygen, residual chlorine, percent total solids, or percent volatile solids.

(a) Conduct Plant Effluent Test.

(b) Conduct Primary Treatment Effluent Test.

(c) Conduct Trickling Filter Effluent Test.

(d) Conduct Activated Sludge (Mixed Liquor) Test.

(e) Conduct Return Sludge Test.

(f) Conduct Final Plant Effluent Test.

(g) Conduct Raw Sludge Test.

(h) Conduct Digested Sludge Test.

(i) Conduct Digester Sampling Test.

(j) Conduct Supernatant Test.

(k) Conduct Stream Sample Test.

E. ENERGY MONITORING CONTROL SYSTEM (EMCS)

1. EMCS Operations

a. Verify All System Points Are Within Tolerance. Verify when coming on duty that all system points are within programmed and designed tolerance. Ensure that corrective action has been taken for all points not in tolerance.

b. Respond to System Alarm. Validate alarm and attempt to correct from console. Determine urgency and inform appropriate work center to take corrective action for an alarm condition that cannot be corrected from the console.

c. Optimize Conservation of Energy Resource. Monitor energy consumption and reduce the consumption where possible.

d. Assist Other Work Center in System Alignment and Troubleshooting. Monitor console during system alignment and troubleshooting and inform work center when sensors are back in tolerance.

2. EMCS Data

a. Provide Data for Energy Report. Collect and validate energy consumption data and forward to appropriate work center.

b. Prepare System Status Report. Prepare digital points, analog points, other points, and alarm status report as required.

c. Maintain Maintenance Schedule. Maintain preventive maintenance schedule for heating, ventilation, and air-conditioning (HVAC) equipment controlled by EMCS.

d. Develop Energy Conservation Bulletin, Graph, or Direcive. Develop bulletin, graph, or directive as required.

3. Program Software

a. Maintain System Data File. Maintain, change, and store current program. Document changes to program.

b. Make Inquiry and Report. Write inquiry, develop graphic, and produce report as required.

c. Modify EMCS. Analyze capability and recommend modification to improve the operation of EMCS.

4. Service Call

a. Receive Call (Normal Duty Hours). Receive call and determine if the condition is a control or system failure problem. Refer problem that cannot be corrected from the EMCS console to the appropriate work center.

b. Receive Call (After Duty Hours). Receive call, document request, and determine classification (emergency, urgent, or routine) of request. Refer request that cannot be corrected from EMCS console to the appropriate work center. Close job order or service call when corrected or refer request not corrected to operations branch, maintenance division for further action.

F. ELECTRIC POWER PRODUCTION

1. Unmanned Emergency Electrical Diesel Power Generating Units.

a. Install Unit. Install diesel generator unit to be used as an emergency source of electrical power. Include initial servicing and exercising unit to ensure correct operation. Cover initial installation of permanently installed unit only.

b. Remove Unit. Remove diesel generator unit when no longer required as an emergency source of elecrical power, or when necessary for overhaul. Prepare unit for shipment to depot or contractor.

c. Replace Unit. Replace or reinstall diesel generator unit removed for overhaul. Service and exercise unit to ensure proper operation.

d. Perform Preventive Maintenance

(1) Exercise Unit. Exercise emergency power diesel generating unit on a regularly scheduled basis. Inspect, adjust, perform minor repair, and cleaning.

(2) Inspect Unit. Complete inspection of emergency power diesel generating system at weekly, quarterly, semiannual, and annual intervals as prescribed by applicable technical orders. Complete required maintenance documentation.

(3) Test Oil Sample. Test oil sample during exercise of emergency power diesel generating systems to ensure proper lubrication.

(4) Change Engine Oil. Drain and replenish oil and replace oil filters based on semiannual change, hours of unit operation, or presence of contaminations on diesel unit. Complete required maintenance documentation.

(5) Refuel Unit. Replenish fuel in tanks of unmanned emergency electrical power generating unit.

e. Perform Unscheduled Maintenance. Perform maintenance action of an unscheduled nature on diesel generator unit. Troubleshoot, repair, remove, and replace component parts of emergency power generating system. Complete required maintenance documentation.

f. Maintain Battery. Maintain lead, acid, or nickel cadmium battery for use with diesel emergency power production systems.

(1) Activate Battery. Activate new battery received from supply by adding electrolyte, and connecting battery to charger.

(2) Deactivate Battery. Deactivate battery for turn-in by neutralizing and draining acid.

(3) Service Battery. Maintain battery currently in use by cleaning, testing, adding electrolyte, and connecting battery to charger.

2. Unmanned Emergency Electrical Gasoline Power Generating Units

a. Install Unit. Install gasoline generator unit to be used as an emergency source of electrical power. Include initial servicing and exercising unit to ensure correct operation. Cover initial installation of permanently installed unit only.

b. Remove Unit. Remove gasoline generator unit when no longer required as an emergency source of electrical power, or when necessary for overhaul. Prepare unit for shipment to depot or contractor.

c. Replace Unit. Replace or reinstall gasoline generator unit removed for overhaul. Service and exercise unit to ensure proper operation.

d. Perform Preventive Maintenance

(1) Exercise Unit. Exercise emergency power gasoline generating unit on a regularly scheduled basis. Inspect, adjust, perform minor repair, and cleaning.

(2) Inspect Unit. Complete inspection of emergency power gasoline generating system at semimonthly, semiannual, and annual intervals as prescribed by applicable technical orders. Complete required maintenance documentation.

(3) Test Oil Sample. Test oil sample during exercise of emergency power gasoline generating systems to ensure proper lubrication.

(4) Change Engine Oil. Drain and replenish oil and replace oil filters based on semiannual change, hours of unit operation, or presence of contaminations on gasoline unit. Complete required maintenance documentation.

(5) Refuel Unit. Replenish fuel in tanks of unmanned emergency electrical power generating unit.

e. Perform Unscheduled Maintenance. Perform maintenance action of an unscheduled nature on gasoline generator unit. Troubleshoot, repair, remove, and replace component parts of emergency power generating system. Complete required maintenance documentation.

f. Maintain Battery. Maintain lead, acid or nickel cadmium battery for use with gasoline emergency power production systems.

(1) Activate Battery. Activate new battery received from supply by adding electrolyte, and connecting battery to charger.

(2) Deactivate Battery. Deactivate battery for turn-in by neutralizing and draining acid.

(3) Service Battery. Maintain battery currently in use by cleaning, testing, adding electrolyte, and connecting battery to charger.

3. Automatic Transfer Panels

a. Install Unit. Install automatic transfer panel used to transfer an electrical load from a failed primary source to an emergency source of power. Include initial installation and servicing, as well as exercising unit to ensure correct operation.

b. Remove Unit. Remove automatic transfer panel when no longer required.

c. Replace Unit. Replace or reinstall automatic transfer panel removed for overhaul. Service and exercise unit to ensure proper operation.

d. Perform Preventive Maintenance

(1) Exercise Unit. Exercise automatic transfer panel on a regularly scheduled basis. Inspect, adjust, perform minor repair, and clean unit. Complete required maintenance documentation.

(2) Inspect Unit. Complete inspection of automatic transfer panel at semimonthly, semiannual, and annual intervals as prescribed by applicable technical orders. Complete required maintenance documentation.

e. Perform Unscheduled Maintenance. Perform maintenance action of an unscheduled nature on automatic transfer panel. Troubleshoot, repair, remove, and replace component parts in unit. Complete required maintenance documentation.

> APPENDIX F

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP) LIFE-CYCLE COST ANALYSIS

1. Metric Conversions

a. Project documentation must be in metric units in accordance with Executive Order 12770 "Metric Usage in Federal Government Programs" dated 25 July 1991.

b. Use the conversion factors in table 1 when preparing ECIP project documentation.

2. Life-Cycle Cost Analysis

a. Use of the latest version of the Building Life-Cycle Cost (BLCC) computer program is required. This software is available from the Efficiency and Renewable Energy Clearinghouse (EREC), PO Box 3048, Merrifield, VA, 22116, l-800-DOE-EREC.

b. Present worth accounting will be used. Use the current discount rate published by the National Institute of Standards and Technology (NIST) in their annual supplement to NIST Handbook 135. This is also available annually from EREC.

c. Actual current costs of energy for the activity will be used as reported in the Defense Utility Energy Report System (DUERS).

d. The latest official regional energy cost escalation rates published in the annual supplement to NIST Handbook 135, also available from EREC, will be used to project future energy costs and to develop present worth values for future energy savings. Overseas activities should use values derived from the tables given for the United States average.

e. The economic life of the retrofit, given in table 2, or the remaining life of the basic facility being retrofitted, whichever is less, will be used in the LCC analysis and in calculating the SIR.

f. Figure F-1 of this appendix is a sample LCC Analysis Summary Sheet.

3. DD Form 1390

a. The DD Form 1390 will be completed in accordance with normal MILCON procedures except that the only projects listed will be the ECIP projects.

b. Figure F-2 of this appendix is a sample of a completed DD Form 1390.

4. DD Form 1391

a. Each DD Form 1391 will have "ECIP" in the title block.

b. Also in the title block will be one of the ten categories from table 1 of this appendix. Those projects with a scope which is not at least 75-percent encompassed by one of the first nine ECIP project categories will be titled "Facility Energy Improvements."

c. The project description must clearly define the conservation measures from which the energy savings will result and the specific facilities being built or modified by the project, as well as the estimated annual and total energy savings.

d. Figure F-3 of this appendix is a sample of a completed DD Form 1391.

5. Base Realignment and Closure Statement

a. Installation commanders shall include the following statement with all ECIP submissions: "The installation affected by these projects is/is not (use appropriate) being considered for closure or realignment."

b. If the installation is being considered, an explanation must be provided for why the project is being considered in the face of closure or realignment. This statement will be in a cover memorandum on the annual submission from each installation.

6. Energy Management Annual Report

a. The annual report shall cover all approved ECIP projects for the last 5 years.

b. The report shall be submitted in digital form. The report template can be obtained from the CMC (LFF).

c. Figure F-4 of this appendix is a sample of the ECIP portion of the annual report from an installation to the CMC (LFF).

TABLE 1. ENERGY CONVERSION FACTORS

	Energy Conversion Factors English	Metric
Purchased Electric Power	3,413 Btu/kwh	3.6 MJ/kwh
Purchased Steam	1,340 Btu/lb	1.41 MJ/lb
Distillate Fuel Oil	138,700 Btu/gal	38.6 MJ/L
Residual Fuel Oil	150,000 Btu/gal	Average thermal content of oil at each installation.
Natural Gas	1,031,000 Btu/1000 ft3	38.85 MJ/cu. m
LPG, Propane, Butane	95,000 Btu/gal	24.6 MJ/L
Bituminous Coal	24,580,000 Btu/s-Ton	28,592 MJ/m-ton
Anthracite Coal	25,400,000 Btu/s-Ton	29,546 MJ/m-ton

NOTES: 1. These conversion factors for fossil fuels should be used only if actual fuel Btu content is not known. Otherwise, actual values should be used.

2. Purchased energy is defined as being generated off-site. For special cases where electric power or steam is obtained from on-site sources, use the actual average gross energy input to the generating plant.

3. The term "coal" does not include lignite. Where lignite is involved, use the Bureau of Mines average value for the source field.

4. Where refuse derived fuel (RDF) is involved, the heat value shall be the average of the RDF being used or proposed or 6,000,000 Btu/Short-Ton if not known.

5. Full energy credit may be taken for conversion from fossil fuels or electric power to solar, wind, RDF, or geothermal energy less the calculated average yearly standby requirement.

TABLE 2. ECIP PROJECT CATEGORIES

Category	Title (Economic Life)	Description
1	Energy Monitoring And Control Systems (EMCS): (15 years)	Projects which centrally control energy systems with the ability to automatically adjust temperature, shed electrical loads, control motor speeds, or adjust lighting intensities.
2	Steam and Condensate Systems: (25 years)	Projects to install condensate lines, cross connect lines, distribution system loops, and rehabilitate existing lines including improved insulation and steam flow meters and controls.
3	Boiler Plant Modifications: (25 years)	Projects to upgrade or replace central boilers or ancillary equipment to improve overall plant efficiency. This includes fuel switching or dual fuel conversion.
4	Heating, Ventilation, Air-Conditioning (HVAC) (15 years)	Projects to install more efficient HVAC or hot water systems. This includes the HVAC distribution system (ducts, pipes, etc.)
5	Weatherizations: (25 years)	Projects improving the thermal envelope of a building. This includes building insulation (wall, roof, foundation, doors), windows, vestibules, earth berms, shading, etc.
6	Lighting Systems: (25 years)	Projects to install replacement lighting systems and controls. This would include daylighting, new fixtures, lamps, ballasts, photocells, motion sensors, IR sensors, light wells, highly reflective painting, etc.
7	Energy Recovery Systems: (25 years)	Projects to install heat exchangers, regenerators, heat reclaim units, or recapture energy lost to the environment.

8	Electrical Energy Systems: (25 years)	Projects that will increase the energy efficiency of an electrical device or system or reduce cost by reducing peak demand.
9	Renewable Energy Systems: (25 years)	Any project using renewable energy. This includes active solar heating, cooling, hot water, industrial process heat, photovoltaic, wind, biomass, geothermal, and passive solar applications.
10	Facilities Energy Improvement: (20 years)	Multiple category projects or those that do not fall into any other category.

ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)
ENERGY/WATER LIFE-CYCLE COST ANALYSIS SUMMARY

INSTALLATION: _____ PREPARATION DATE: _____
LOCATION: _____REGION NO.: ____ PROJECT NO. _____
PROJECT TITLE: _____ FISCAL YEAR: _____
BASE DATE: _____ BOD (a): _____ ECONOMIC LIFE_____
DISCOUNT RATE:_____ PREPARED BY: _____
BLCC INPUT DATA FILES: PROJECT: _____ BASE CASE: _____

1. INVESTMENT

A. CONSTRUCTION COST	$_____	
B. SIOH	$_____	
C. DESIGN COST	$_____	
D. TOTAL COST (1A + 1B + 1C)	$	FUNDING AMOUNT:
E. SALVAGE VALUE OF EXISTING EQUIPMENT	$_____	
F. PUBLIC UTILITY COMPANY REBATE	$_____	
G. TOTAL INVESTMENT (1D + 1E + 1F)	$	PRESENT VALUE:

(b)

2. ENERGY AND WATER SAVINGS (+) OR COST (-)
ANALYSIS DATE SAVINGS, UNIT COSTS, & DISCOUNTED SAVINGS
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: _____

FUEL	UNIT COST SAVINGS $/MJ (1)	MJ/YR (2)	ANNUAL SAVINGS ($) (3)	DISCOUNT FACTOR (4)	DISCOUNTED SAVINGS ($) (5)
A. ELECTRIC	_____	_____	_____	_____	_____
B. NAT GAS	_____	_____	_____	_____	_____
C. LPG	_____	_____	_____	_____	_____
D. #1 FUEL OIL	_____	_____	_____	_____	_____
E. #2 FUEL OIL	_____	_____	_____	_____	_____
F. #6 FUEL OIL	_____	_____	_____	_____	_____
G. KEROSENE	_____	_____	_____	_____	_____
H. MOGAS	_____	_____	_____	_____	_____
I. RECYCLED OIL	_____	_____	_____	_____	_____
J. COAL	_____	_____	_____	_____	_____
K. DEMAND SAVINGS	_____	_____	_____	_____	_____
L. SUBTOTAL	_____	_____	_____	_____	_____
	$/Ml	Ml/YR	ANNUAL SAVINGS	DISCOUNT FACTOR	DISCOUNTED SAVINGS
M. WATER USE	_____	_____	_____	_____	_____
WATER DISP	_____	_____	_____	_____	_____
SUBTOTAL			_____		_____
N. TOTAL			_____		_____

Figure F-1.--Energy Conservation Investment Program (ECIP))
Energy/Water Life-Cycle Cost Analysis Summary.

NON-ENERGY SAVINGS (+) OR COST (-)

A. ANNUALLY RECURRING (+/-) _____

(1) DISCOUNT FACTOR (TABLE A) _____

(2) DISCOUNTED SAVINGS/COST (3A x 3A1) _____

B. NON-ANNUALLY RECURRING (+/-)

ITEM	SAVINGS (+) COST (-) (1)	OCCURRENCE (FROM BOD) (2)	FACTOR (TABLE A-1) (3)	DISCOUNTED SAVINGS OR COST (4)
a. _____	_____	_____	_____	_____
b. _____	_____	_____	_____	_____
c. _____	_____	_____	_____	_____
d. _____	_____	_____	_____	_____
e.Total	_____			_____

C. TOTAL NON-ENERGY SAVINGS (+)/COST (-) (3A(2)+3Be(4)) _____

4. FIRST YEAR SAVINGS (2K5 + 3A2 + (3Be4/yrs economic life))_____

5. SIMPLE PAYBACK PERIOD (1G/4) _____

6. TOTAL DISCOUNTED SAVINGS (215 + 3C) _____

7. SAVINGS TO INVESTMENT RATIO (SIR = 6 / 1G) _____

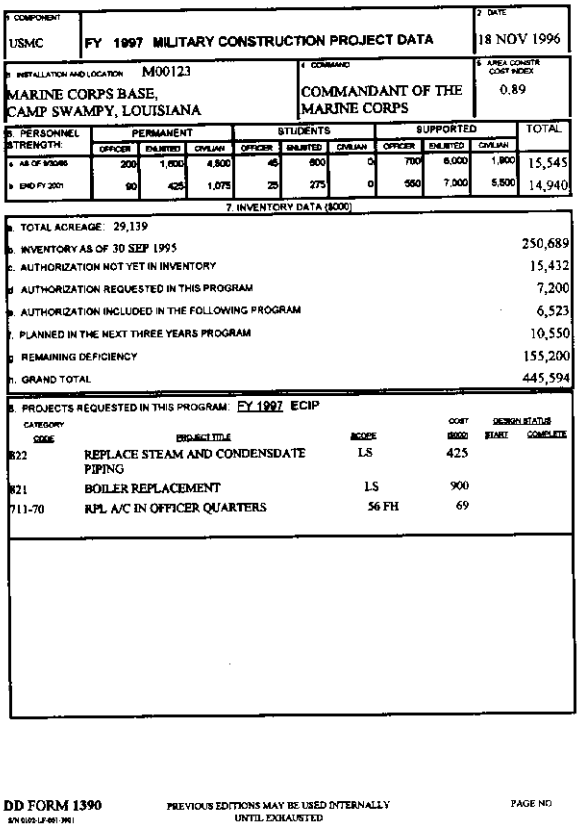
8. ADJUSTED INTERNAL RATE OF RETURN (AIRR) _____

(a) BOD = BENEFICIAL OCCUPANCY DATE (SERVICE DATE)

(b) PRESENT VALUE IS LESS THAN ACTUAL COST WHEN INVESTMENT COSTS ARE INCURRED AFTER BASE DATE.

NOTE: THIS FILE IS PRODUCED FROM N.I.S.T. BLCC 4.3-96

Figure F-1.--Energy Conservation Investment Program (ECIP)
Energy/Water Life-Cycle Cost Analysis
Summary--Continued.



1. COMPONENT: USMC

FY 1997 MILITARY CONSTRUCTION PROJECT DATA

2. DATE: 18 NOV 1996

3. INSTALLATION AND LOCATION: M00123
MARINE CORPS BASE,
CAMP SWAMPY, LOUISIANA

4. COMMAND: COMMANDANT OF THE MARINE CORPS

5. AREA CONSTR COST INDEX: 0.89

6. PERSONNEL STRENGTH:	PERMANENT			STUDENTS			SUPPORTED			TOTAL
	OFFICER	ENLISTED	CIVILIAN	OFFICER	ENLISTED	CIVILIAN	OFFICER	ENLISTED	CIVILIAN	
a. AS OF 9/30/96	200	1,600	4,800	45	600	0	700	6,000	1,900	15,545
b. END FY 2001	90	425	1,075	25	275	0	550	7,000	5,500	14,940

7. INVENTORY DATA ($000)

a. TOTAL ACREAGE: 29,139	
b. INVENTORY AS OF 30 SEP 1995	250,689
c. AUTHORIZATION NOT YET IN INVENTORY	15,432
d. AUTHORIZATION REQUESTED IN THIS PROGRAM	7,200
e. AUTHORIZATION INCLUDED IN THE FOLLOWING PROGRAM	6,523
f. PLANNED IN THE NEXT THREE YEARS PROGRAM	10,550
g. REMAINING DEFICIENCY	155,200
h. GRAND TOTAL	445,594

8. PROJECTS REQUESTED IN THIS PROGRAM: FY 1997 ECIP

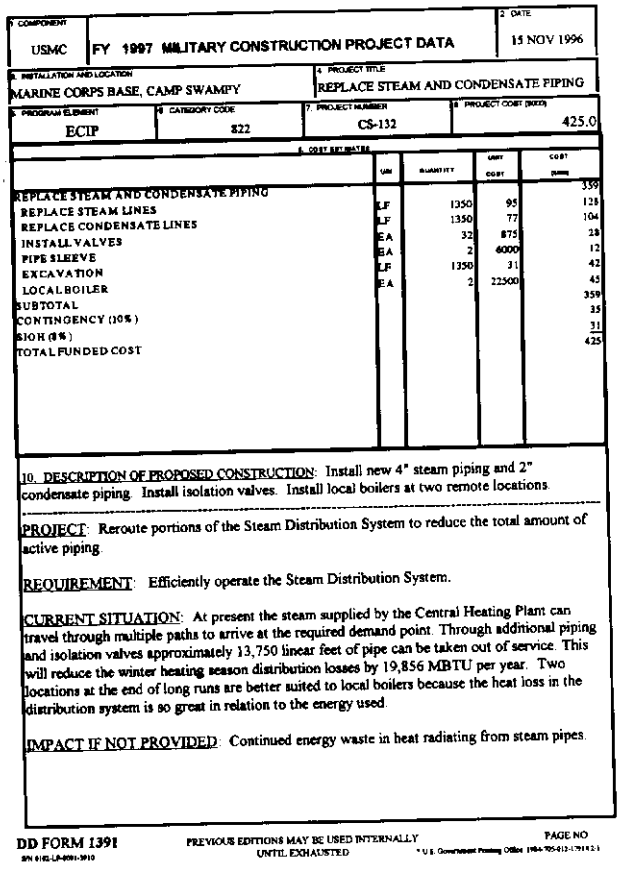
CATEGORY CODE	PROJECT TITLE	SCOPE	COST ($000)	DESIGN STATUS START	DESIGN STATUS COMPLETE
822	REPLACE STEAM AND CONDENSDATE PIPING	LS	425		
821	BOILER REPLACEMENT	LS	900		
711-70	RPL A/C IN OFFICER QUARTERS	56 FH	69		

DD FORM 1390
S/N 0105-LF-001-3901

PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED

PAGE NO

Figure F-2.--DD Form 1390.



1. COMPONENT: USMC

FY 1997 MILITARY CONSTRUCTION PROJECT DATA

2. DATE: 15 NOV 1996

3. INSTALLATION AND LOCATION: MARINE CORPS BASE, CAMP SWAMPY

4. PROJECT TITLE: REPLACE STEAM AND CONDENSATE PIPING

5. PROGRAM ELEMENT: ECIP

6. CATEGORY CODE: 822

7. PROJECT NUMBER: CS-132

8. PROJECT COST ($000): 425.0

9. COST ESTIMATES

	U/M	QUANTITY	UNIT COST	COST ($000)
REPLACE STEAM AND CONDENSATE PIPING				359
REPLACE STEAM LINES	LF	1350	95	128
REPLACE CONDENSATE LINES	LF	1350	77	104
INSTALL VALVES	EA	32	875	28
PIPE SLEEVE	EA	2	6000	12
EXCAVATION	LF	1350	31	42
LOCAL BOILER	EA	2	22500	45
SUBTOTAL				359
CONTINGENCY (10%)				35
SIOH (8%)				31
TOTAL FUNDED COST				425

10. DESCRIPTION OF PROPOSED CONSTRUCTION: Install new 4" steam piping and 2" condensate piping. Install isolation valves. Install local boilers at two remote locations.

PROJECT: Reroute portions of the Steam Distribution System to reduce the total amount of active piping.

REQUIREMENT: Efficiently operate the Steam Distribution System.

CURRENT SITUATION: At present the steam supplied by the Central Heating Plant can travel through multiple paths to arrive at the required demand point. Through additional piping and isolation valves approximately 13,750 linear feet of pipe can be taken out of service. This will reduce the winter heating season distribution losses by 19,856 MBTU per year. Two locations at the end of long runs are better suited to local boilers because the heat loss in the distribution system is so great in relation to the energy used.

IMPACT IF NOT PROVIDED: Continued energy waste in heat radiating from steam pipes.

DD FORM 1391 PREVIOUS EDITIONS MAY BE USED INTERNALLY UNTIL EXHAUSTED PAGE NO

Figure F-3.--DD FORM 1391

U.S. MARINE CORPS
ECIP Annual Report Summary (1/)

INSTALLATION
FUND SOURCE 2/

		FY 91	FY 92	FY 93	FY 94	FY95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03
Number of Projects Authorized														
Millions of Dollars Authorized														
Number of Projects Appropriated														
Millions of Dollars Appropriated														
Number of Projects Completed														
Millions of Dollars Used	3/													
Number of Projects Cancelled														
Millions of Dollars of Cancelled Projects														
Estimated Energy Savings (MBTU)	4/													
Actual Energy Savings (MBTU)	5/													
Estimated Annual Savings ($000)	4/													
Actual Annual Savings ($000)	5/													

1/ A separate information sheet shall be maintained at the Service Program Management Office for any project cancelled, deferred beyondthe Fiscal Year authorized, reduced in scope by more than 25 percent, that exceeds the authorized amount by more than 25 percent, or that fails to save less than 75 percent of the original estimated savings
2/ Separate Summary Sheets shall be submitted for MILCON Active Forces, Family Housing, Reserve, and Guard
3/ Actual amounts for program years that have completed and for those program years not completed, use the total actual expendiures on completed projects and the current working estimates of projects not yet completed
4/ As originally provided to the Congress
5/ Actual validated cost savings including current estimates based on the latest scope of those projects not yet completed or validated.

Figure F-4.--ECIP Section of Energy Management Annual Report

REAL PROPERTY FACILITIES MANUAL, VOLUME VI

APPENDIX G

PUBLIC, PRIVATE CAPITAL VENTURES

(To Be Published at a Later Date)

>APPENDIX H

ENERGY/UTILITY SYSTEMS VULNERABILITY

A. BACKGROUND. Energy is a key ingredient of national security. An adequate, reliable supply of energy is essential to performance of the military missions. Energy security guidance is given in DoDInst 4170.10 and is amplified by Defense Energy Program Policy Memorandum (DEPPM) 92-1 of 14 January 1992.

B. RESPONSIBILITIES. Activities will:

1. Conduct energy vulnerability analyses and review for currency annually.

2. Establish energy emergency preparedness and operation plans.

3. Develop and execute remedial action plans to remove unacceptable energy security risks. Analyses and plans will be developed using the definitions and guidelines below.

C. DEFINITIONS

1. Energy. Conventional energy such as coal, petroleum products, steam and /or hot water, electricity, natural gas and propane, and (as appropriate) including military operational fuels and propellants, whether purchased or generated/produced by DoD, but excluding nuclear energy used in ship propulsion.

2. Critical Energy Requirements. Those functions which require a continuous supply of energy during an emergency. Those functions may include housing, life safety/health (e.g., hospitals), public safety (e.g., police and fire departments), communications, environmental systems, and critical mission support.

3. Energy Emergency Preparedness and Operations Plan. A document indicating the steps to be undertaken at an installation to prepare for and recover from an energy emergency.

4. Remedial Action Plan. A document indicating corrective actions required to remove unacceptable risks from potential failure of energy systems, and the planning, programming, and budgeting actions necessary to implement the corrections.

5. Risk. The chance or probability that a given level of vulnerability will be experienced.

6. Acceptable Risk. Risk of energy supply losses which can be tolerated or mitigated to the extent that an organization can perform its basic mission.

7. Objective Risk Factors. These include natural hazards, such as storms and accidents that damage source, storage, or distribution facilities.

8. Subjective Risk Factors. These include potential deliberate acts, such as sabotage, to destroy energy supplies or systems.

9. Unacceptable Risk. An estimate that energy supply interruptions are both reasonably likely and cannot be sufficiently mitigated or tolerated to permit the affected organization(s) to perform.

10. Supplier. The military activity that provides utility services to all tenants of an installation.

11. Utilities Energy. Energy supplies for facilities, including electricity, natural gas, coal, steam/hot water, propane and fuel oil; excluding mobility fuel.

12. Vulnerability. The degree to which an organization's mission or activity depends on the availability of a specific energy supply or service. Note: dependence is not, in itself, cause for corrective action.

D. VULNERABILITY ANALYSIS, ENERGY EMERGENCY PREPAREDNESS AND OPERATIONS PLANS AND REMEDIAL ACTION PLAN GUIDELINES

1. The goal is to create an Energy Vulnerability Analysis, an Energy Emergency Preparedness and Operations Plan for operating under emergency conditions and, if required, a Remedial Action Plan, for each Defense installation. It is recommended that each DoD installation create an Energy Security Planning Board (ESPB). The utilization of an ESPB, with the installation commander or designated representative as chairman and representation from each tenant/command, will help to ensure a coordinated planning and recovery effort.

2. The minimum factors to be considered when performing the analyses are listed below in paragraphs 3, 4, and 5. The factors are written generically for all energy types, although some clearly do not apply in all situations. Facility energy supplies that are directly dependant upon the performance of public utilities will, for example, be analyzed differently from military supply systems for petroleum products or energy supplied from facilities entirely within the bounds of an installation.

3. Vulnerability analyses will:

(a) Define critical energy requirements and the facilities driving and supporting the requirements. (The collection of this level of data will help to determine allocation of funding and manpower resources, both for planning of remedial actions and for recovery during an emergency.)

(b) Evaluate vulnerabilities to energy supply losses to determine potential objective and subjective risks of energy supply disruptions. (Unacceptable risks require corrective action. Distinguishing between objective and subjective factors may help indicate the type of remedial action, the likelihood of successfully coping with the risk factor and, in some cases, the type of public authority most appropriate for dealing with the risk element.)

(c) Define customer/tenant responsibilities. (Each tenant will specifically identify the energy requirements essential for continued operation and why, in priority order. Example: a tenant with a computer controlling operations equipment may require power for the computer, but not the facility lights.)

(d) Define supplier responsibilities. (Those responsibilities should include identification of distribution systems vulnerabilities, the impact of system failure, and the remedial action necessary to ensure system operation based on the level of recovery dictated by the requirement. The supplier should assess portable emergency generator needs, by location and size, and initiate action to obtain the equipment or develop the means to transport it to its emergency location, if on hand elsewhere. The supplier should also evaluate physical security vulnerabilities, as they relate to energy security, and take mitigating action. Consideration should be given to the availability of manpower and equipment from other military and federal govenment sources and action taken to arrange provision of such resources, including the logistic support required while on station.)

4. Energy Emergency Preparedness and Operations Plans will:

(a) Contain procedures for the execution of critical base missions if the energy supply is lost. (These plans may include movement to an alternate location, performance of tasks manually, provision of back-up power by tenant or host, etc. The supplier and each tenant should also finalize personnel recall procedures, complete with personnel emergency work assignments and the method of contact, particularly when public communications systems are not operational.)

(b) Identify critical energy requirements to the public utilities for integration into their service restoration plans.

(c) Identify communication channels between the installation, other DoD and Federal authorities, and State and local emergency officials. (Assign and coordinate the radio frequencies to be used during the recovery effort. Additionally, communication channels between the installation and intelligence officials should also be identified.)

(d) Identify installed emergency generators and inventory by location, size, and fueling requirements. (Ensure each generator, installed as well as postable, is receiving necessary preventive maintenance and testing, in accordance with the manufacturer's recommendations, and that all operators are designated and trained annually to operate the equipment. An emergency fueling plan for all generators should be developed and coordinated directly with the fuel supplier.)

(e) Include appropriate mutual aid agreements. (Ensure mutual aid agreements have been negotiated, as necessary, with State and local officials , as well as the servicing public utilities, to assist in the installation's recovery and to minimize loss of life in the outlying communities.)

(f) Include procedures to ensure that information reported to service/agency equipment managers on emergency utility and other types of equipment are kept current and accurate.

(g) Identify local sources of labor, material and equipment, as well as off-base energy providers, other than public utilities, for use in the recovery operations.

(h) Provide for annual training to management personnel on the details of the emergency plan and the specific procedures they must follow.

(i) Include procedures to facilitate review of construction projects for adequate energy security planning as well as for consideration of the impact projects will have on the existing recovery plan.

5. Remedial Action plans will:

(a) Prioritize unacceptable risks and set milestones to correct them. (The ESPB shall establish cost/benefit criteria for the analysis of these actions, where such do not already exist. Ensure critical base missions are recognized in the service restoration plans of the public utilities and off-base service providers.)

(b) Provide for budgeting when significant expenditures are required to effect remedial actions.

(c) Specify at least annual review of milestones.

APPENDIX I

MUSE MANAGEMENT

A. FUNCTIONS OF COMNAVFACENGCOM PROGRAM MANAGER

1. Exercise management control over all aspects of the MUSE program.

2. Establish plans, programs, and budgets to acquire, overhaul, modify, and store MUSE.

3. Establish policy and programs to manage and execute the MUSE program.

4. Assign overhaul costs and annual rates for equipment deployed to naval industrial fund activities to permit annual amortization of a proportionate share of the overhaul cost.

5. Allocate funds to procure and overhaul equipment.

6. Establish MUSE inventory readiness levels and assure adequacy of condition inspection procedures for assigned equipment.

7. Provide denial of deployment extension requests when the justification fails to meet established criteria for continued MUSE deployment in cases where extension will result in a total deployed period in excess of 36 months but less than 72 months. Forward requests for deployment extensions which result in a total deployment period in excess of 72 months to CNO for action.

8. Establish policy and guidance for all aspects of MUSE employment including analysis of requirements and funding responsibilities.

9. Approve transfer/disposal/excessing of MUSE.

10. Establish policy for development of MUSE maintenance management and integrated logistic support.

11. Monitor demand and use of MUSE inventory and make recommendations to CNO for inventory objectives for each type of equipment.

12. Assist CNO in matters involving the MUSE program. Staff requests and correspondence requiring higher authority action including requests that entail transfer between major claimants.

13. Approve research, development, and test projects to improve equipment features of special importance to MUSE applications. Coordinate with other offices and agencies managing or operating similar equipment.

14. Establish management information and control system to provide accurate and timely data for program planning and decisionmaking.

15. Establish and integrates logistics support plans and policy for the MUSE program.

16. Establish policy and guidance for the computer-assisted planning, programming, and budgeting support system of the MUSE program.

B. FUNCTIONS OF NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY

1. Exercise operational engineering and inventory control over the MUSE program.

2. Develop MUSE program inventory objectives and equipment levels in consonance with requirements and mission objectives.

3. Develop plans, programs, and budget requirements to acquire, overhaul, modify, and store MUSE. Analyze operation, maintenance, and use data for budget development.

4. Develop the computer-assisted planning, programming, and budgeting support system for operational management, and the overhaul and procurement funding requirements for the MUSE program.

5. Develop plans, criteria, and procedures for MUSE maintenance management and integrated logistic support.

6. Administer MUSE O&M,N, OPN, and mission management funds provided by COMNAVFACENGCOM for the MUSE program.

7. Establish engineering requirements using technical parameters for new equipment procurement, overhauls, and equipment modifications. Effect development of technical specifications and preparation of equipment designs.

8. Provide professional engineering and technical assistance to contracting agencies to procure, overhaul, and modify MUSE. This shall encompass the following:

a. Prepare or help prepare both engineering and technical portions of pland and specifications.

b. Review contractors' designs, proposals, software submissions, and estimates.

c. Establish test and performance requirements, reliability and maintainability standards, equipment support parts, and software requirements.

d. Act as the procuring contracting officer's technical representative for all contractual actions.

e. Coordinate manufacturer technical representative service contracts and warranty actions.

f. Defining technology in contract specifications and forwarding issues requiring resolution to COMNAVFACENGCOM.

g. Provide cost information to the OIC NAVFACENGCOM contracts to help prepare Government cost estimates.

9. Analyze requests, evaluate technical justifications, and coordinate system designs for MUSE through applications engineering.

10. Refer to COMNAVFACENGCOM requests that do not meet MUSE deployment criteria or that cannot be met with readily deployable assets, which would necessitate transfer of assets between major claimants.

11. Coordinate deployment of MUSE assets with activities, EFD's, and major claimants. Forward requests for deployment extensions which result in a total deployment period which exceeds 36 months to COMNAVFACENGCOM for approval or further action as appropriate.

12. Deploy MUSE to requesting activity. Perform preshipment, destination, and deployment termination inspections of MUSE. Assure equipment is deployed in operating condition with equipment support parts and operations manuals.

13. Notify COMNAVFACENGCOM of recommendations, comments, or changes in specified utilization of deployed MUSE.

14. Perform engineering services and provide guidance or services, including technical assistance in equipment installation, establishment of operation and maintenance standards and schedules, troubleshooting, operator training, maintenance personnel indoctrination, and minor repairs. Help using activities obtain support parts.

15. Schedule and perform on-site equipment inspections of MUSE assets with regard to:

a. Equipment condition and maintenance.

b. User operation and maintenance procedures and documentation.

c. Verification of MUSE application and utilization.

d. Maintenance of equipment manuals and MUSE software items.

e. Maintenance of equipment support parts.

16. Maintain equipment history files, preventive maintenance records, management information systems, equipment status reports, manufacturers' literature, and as-built drawings.

17. Prepare and distribute preventive maintenance manual support parts lists, equipment technical manuals, supplements, and other support software as required.

C. FUNCTIONS OF NAVFACENGCOM ENGINEERING FIELD DIVISIONS (EFD)

1. Validate MUSE requests. Make specific recommendations on the suitability of MUSE to meet an activity's requirement. Where possible, alternative solutions to MUSE deployment will be provided.

2. Assist activities plan and engineer for MUSE support including evaluation of utility requirements, identification of utilities system deficiency, design of MUSE installations, and contractual support for operation and maintenance of MUSE.

3. Help activities and claimants prepare project submissions incident to MUSE installations. Provide engineering and contractual services as required for project accomplishment.

4. Monitor cognizant MUSE deployments and comment on continued need, changed requirements, and other conditions affecting the deployment.

5. Upon request by CO NEESA, conduct economic analyses for equipment on extended (over 36 months) deployments to evaluate retention of the unit(s).

6. Advise activities on operating procedures for MUSE as an integral element of the total utility system.

D. FUNCTIONS OF OIC NAVFACENGCOM CONTRACTS, DAVISVILLE

1. Administration

a. In the capacity of the MUSE procuring contracting officer (PCO), and using requirements documentation provided by CO NEESA, prepare, advertise, negotiate, award, execute, and administer IFB and RFP contracts, contract modifications, addenda, and supplemental agreements to procure MUSE hardware, software, spare hand repair parts, equipment rehabilitation, overhaul and testing, and A&E studies and services.

b. Coordinate and control, as required and directed, O&M,N OPN and NIF funds forwarded by CO NEESA for contractual actions.

c. Serves as focal point to prosecute actions arising out of warranty, guarantee, and latent defect claims connected with the contracts.

d. Arranges for USN registration of newly procured equipment and provides registration numbers to contractors.

2. Technical Services

a. Prepare contract specifications, purchase descriptions, scope-of-work documents, and changes or modifications thereto, using requirements documentation provided by CO NEESA.

b. Prepare Government cost estimates to negotiate and/or award contracts and contract modifications.

c. Review, evaluate, and provide recommendations to CO NEESA on both technical and contractual aspects of the following:

(1) Contractor originated engineering change proposals and value engineering change proposals.

(2) Contractor submittals for Government review of equipment selections, designs, drawings, and software.

(3) Proposals, solicited or unsolicited, from prospective contractors.

d. Provide technical interpretation for contract specifications; forward issues in the specifications that are found to be vague to COMNAVFACENGCOM (Code 021) for resolution.

e. Witness acceptance testing of items being procured.

E. CLAIMANT AND USING ACTIVITY RESPONSIBILITIES

1. Major claimants will endorse and validate request for MUSE, and will include a plan of action and milestone (POA&M) to solve the utility deficiency.

2. Activities to which MUSE is deployed are responsible for the following:

a. Request and justify MUSE as prescribed by this Manual, ensuring that deployment and use complies with OPNAVINST 11300.5B.

b. Plan and accomplish construction or alteration projects necessary to site, install, and connect MUSE. Planning help may be obtained from the cognizant EFD and from CO NEESA.

c. Participate in equipment inspections upon arrival, during deployment, and at deployment termination, as described in section G.

d. Make equipment available, on an annual basis, for complete operational and nonoperational inspection and testing by NEESA.

e. Execute MUSE Deployment Agreement, paragraph F of this appendix, with CO NEESA.

f. Maintain and operate assigned MUSE per operating and maintenance instructions and manuals and directives from CO NEESA.

g. Ensure that operating and maintenance personnel are provided and trained on the equipment. Request training assistance from CO NEESA, if necessary.

h. Establish, post, and enforce safety procedures.

i. Site MUSE to reduce accident hazards and provide security against damage, vandalism, pilferage, and cannibalization in a manner that will facilitate rapid redeployment.

j. Accomplish necessary housekeeping, cleaning, and painting to maintain acceptable physical appearance. Replacement MUSE banners and seals are available upon request from CO NEESA.

k. Maintain instructions, manuals, and parts catalogs in an up-to-date status. Maintain equipment support parts at the level required by the parts inventory.

l. Operation expenses for MUSE assigned as prescribed in the NavCompt Manual, volume 7, paragraph 075150.

(1) Installation and disconnection costs involving construction, alteration, or modification projects necessary to site, install, and connect MUSE.

(2) All operation and maintenance expenses which include costs for repairs required either during or after extended (over 36 months) use.

(3) Intra-activity transportation costs after arrival.

(4) Restocking of equipment support parts as they are consumed.

(5) Deployment termination cost as follows:

(a) Disconnection, equipment support parts replenishment, and preparation for shipment.

(b) Repair and rehabilitation costs, identified during the deployment termination inspection to return the unit to operational condition ready for redeployment. This

requirement may be waived by CO NEESA if the unit is scheduled for overhaul upon deployment termination.

(6) A proportionate annual share of the equipment overhaul cost, in addition to the above costs, when the activity is financed under the Naval Industrial Fund. These overhaul costs will be amortized and administered as a planned equipment expense for contractual services per the provisions of industrial fund regulations in NavCompt Manual, volume 5, paragraph 052502. Changes or adjustments in deployment and assessed annual costs will be reconciled through the CO NEESA.

(7) The definitions for overhaul and repair are as follows:

(a) Overhaul. Complete disassembly of a unit, including disassembly of all parts and components, followed by inspection, rebuilding, and reassemble to return the unit to "like new" condition.

(b) Repair. Restoration or replacement of parts or components, including partial disassembly or removal, and repair of major components as necessary to return the complete unit to an efficient, safe, and reliable operating condition.

m. Submit all warranty questions to CO NEESA. Under no circumstances is the equipment manufacturer to be contacted regarding warranties.

n. Promptly advice CO NEESA by message of any component failure which renders MUSE inoperable or reduce its rated capacity. Data shall be submitted in the following format:

(1) Date Time Group of Casualty.

(2) USN registration number.

(3) Nomenclature of failed assembly, component, or part.

(4) Condition after failure (effect on equipment).

(5) Operating conditions at time of failure.

(6) Chronology of events before and after failure.

(7) Conclusion as to cause.

(8) Impact on served facility or interfacing utility.

(9) Assistance required from CO NEESA.

o. Prepare for shipment and ship equipment as directed by CO NEESA. Complete packaging checklists and forward copies to CO NEESA and to the equipment consignee. All instructions,

manuals, and equipment support parts will accompany the equipment. MUSE shall be blocked and braced internally and externally prior to shipment per packaging instructions provided by the CO NEESA. USN registration numbers shall be placed on all shipping correspondence and containers. Advise CO NEESA and destination activities of the details regarding the shipment; i.e., routing, Government Bill of Lading (GBL) number, carrier, and estimated time of arrival (ETA).

F. MUSE DEPLOYMENT AGREEMENT

This agreement is entered into this ____ day of _____, 19__ between the undersigned for the utilization of a Mobile Utilities Support (MUSE) unit(s) identified below for a period of _____ months with an effective termination date of _____.

This agreement is executed under the provision of NAVFACINST 11310.2E.

The parties hereto agree as follows:

GENERAL PROVISION

1. Scope. This agreement defines and delineates responsibilities assumed by the parties hereto for the deployment of the unit(s) listed as follows:

USN	Type	Capacity	Estimated Delivery Date

MCON Project No., Project Title, and Description of Use as follows:

2. General

a. MUSE siting and installation will be per instructions, directives, and guidance provided by CO NEESA prior to receipt of MUSE.

b. Since in-transit damage does occur, it is imperative that all damages be noted prior to signing the government bill of lading (GBL) so that resolution of damage can be accomplished. Failure to note damage will constitute activity acceptance of the responsibility to fund and repair all in-transit damage.

3. Using Activity Responsibilities. The using activity agrees to the following stipulations and terms of deployment:

a. Transportation Costs

(1) Navy activities will be provided a Transportation Account Code (TAC) number by CO NEESA for transportation costs.

(2) Activities, other than Navy and Marine Corps, agree to bear all transportation costs of deploying MUSE from its present location to the intended utilization site and return.

b. Receipt. Assume full responsibility for MUSE and provide funding or direct support, for security off-loading from the carrier, movement to the intended site siting, installation; and initial startup.

c. Operation. Provide competent operating personnel and ensure that operation of the equipment conforms to applicable safety standards and the provisions of technical publications and procedures established for the equipment.

d. Maintenance. Provide competent maintenance personnel and funding for material to ensure the performance of all maintenance prescribed within technical publications and procedures established for the equipment or to accomplish repairs as necessary. This is to ensure that equipment remains in a readily deployable condition. For extensive repairs, scheduled or unscheduled, notify CO NEESA for approval prior to commencement of the maintenance work.

e. Repairs. Perform or effect repairs as shown necessary by CO NEESA inspections to maintain the unit in a ready condition for redeployment.

f. Supplies. Provide expendable operating supplies and the timely replenishment and/or funding for on-board equipment support parts used.

g. Software. Maintain O&M Manuals, adequate operating data and logs, and accurate documentation of performed maintenance or repair. This requirement does not supersede any requirement established by the using activity.

h. Equipment Relocation or Reallocation. Activities shall not, subsequent to initial installation, remove, or relocate the equipment without previous authorization from CO NEESA. Additionally, changes in utilization, extended deployment, or other than that which MUSE was originally deployed by this agreement shall be treated as a new deployment and a new request must be submitted accordingly.

i. Inspection. Activities shall be informed of general and specific deficiencies found during inspections as prescribed by paragraph G of this appendix. The using activity, other than Navy and Marine Corps, will reimburse the CO NEESA for expenses incurred by this inspection. Activities shall initiate action to remedy deficiencies and/or take appropriate action as recommended by CO NEESA.

j. Deployment Termination. At the end of this deployment period, a joint termination inspection will be made, composed of representatives from the using activity and NEESA personnel.

(1) Support Parts. A completed inventory of equipment support parts will be compared with the inventory made prior to assignment. Items missing or in condition requiring replacement will be specifically noted. Such items shall be replaced, purchased, or requisitioned immediately by the using activity. Replacement items on order at time of shipment of the MUSE shall be forwarded upon receipt to the new consignee and a document indicating shipment shall be forwarded separately to the consignee with a copy to CO NEESA.

(2) Major Repair and Rehabilitation. (See paragraph E1(7) of this appendix. Major repair and rehabilitation costs, as determined necessary by deployment termination inspection to return the effected, are funded by the using activity.

(3) Packaging/Shipping. While transportation costs shall be as tated in paragraph F3a of this appendix, the cost attributable to dismantling, packaging, blocking, crating, and bracing shall be the responsibility of the using activity. Activities will complete preshipment packaging as prescribed by CO NEESA and forward completed copies of checklists describing such action to the receiving activity being held responsible for funding repairs of shipping damage. In addition to the specific items of the packaging instructions, the shipment preparation of MUSE shall include:

(a) Blocking and bracing equipment internally and externally per the shipment preparation instructions provided by CO NEESA prior to release to shipper.

(b) Placing USN registration number of MUSE on all shipping correspondence and containers.

(c) Preparing shipping documents with a specific list of nonintegral items such as lifting slings, muffler assemblies, or separately packaged parts.

4. Commanding Officer, Naval Energy and Environmental Support Activity Responsibilities. CO NEESA agrees to provide the equipment, service, and technical support as follows:

a. Provide the using activity with equipment which is safe, reliable, and capable of operation at rated capacity.

b. Provide all information and coordination necessary to adequately plant the MUSE installation to include copies of manufacturers' O&M Manuals, formulate installation criteria, and review of application drawings.

c. Provide, upon request, on-site technical support in the following areas:

(1) Siting, installation, and connection.

(2) MUSE check-out and initial startup.

(3) Minor repair and/or troubleshooting.

(4) Operator training and maintenance personnel indoctrination.

(5) Advice concerning operation, maintenance, repair, or overhaul of MUSE.

These services by CO NEESA should be requested in writing and will be contingent upon availability of personnel and suitable agreement of funding between the requesting activity and CO NEESA. A funding document should cite the services to be performed, the estimated cost thereof, and the fund citation.

d. Conduct inspections as described in section G and provide inspection critique prior to departure following each inspection to the CO, PWO, or their representative. CO NEESA will provide guidance and direction together with applicable forms and other software as required to assist activities in carrying out their responsibilities.

5. Recall of MUSE. The equipment deployed is subject to recall at any time for more urgent requirements. Such recall shall be issued only when it is established by higher authority that urgency of the intended use is of higher priority than the need for the equipment at the current utilization site.

6. Terms of the Agreement

a. This agreement will continue in effect for the defined deployment period unless terminated earlier under the provisions of paragraph F5 of this appendix. Earlier termination, at the option of using activity, may be effected by issuing a notice to the CO, Naval Energy and Environmental Support Activity, Port Hueneme, CA 93040-5014, 90 days prior to the intended date of termination.

b. Review, negotiation, or amendment of the agreement may be initiated at any time by written request of either of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year written. Navy activities can execute this agreement by message to CO NEESA.

_____	_____
_____(title)	_____
CO or designated representative the using activity	Commanding Officer, Naval Energy and Environmental Support Activity, Port Hueneme, CA 93043-5014 DSN: 551-5323 Commercial: 805-982-5323 _____(telephone)

G. MUSE DEPLOYMENT AND MAINTENANCE INSPECTION PLAN

1. MUSE assets will be inspected on-site for the purpose of assuring that the equipment is being properly maintained and operated. Inspections will be accomplished by NEESA. Field inspections shall include, but are not limited to, the following categories:

a. Installation Inspection. This inspection will be incorporated with installation/startup assistance normally provided by NEESA personnel. The purpose is to ensure that interfacing hardware and services are adequate, siting criteria has been met, and to validate the equipments' condition and performance which will serve as a baseline for future periodic inspections. Operator and maintenance personnel training and indoctrination will also be conducted at this time. It will be the using activity's responsibility to maintain this cadre of trained personnel.

b. Operation and Maintenance Inspections. Inspections, coordinated with the EFD and the using activity, will be conducted on an announced basis to determine equipment condition, verify MUSE application and utilization, evaluate user operation and maintenance procedures, and the effectiveness of the user applied maintenance program, review operation and maintenance logs and reports, and ascertain the completeness of O&M manuals and the equipment support parts inventory.

c. Deployment Termination Inspection. Inspect on an as-required basis to assure that the equipment can provide safe and reliable operation at rated capacity prior to relocation. Inspections will consist of all points covered in the maintenance inspection and will require a loaded operational test to evaluate equipment performance. Packaging requirements, including checklists, will be provided by CO NEESA for completion by the shipping activity prior to release of the MUSE.

d. Additional/Follow-Up Inspections. When it is considered that the results of inspections outlined above denote the need for additional inspections and effort to accomplish user responsibilities stated in paragraphs E and F of this appendix, reinspection will be performed as required.

2. Subsequent to each inspection addressed in paragraph G1 of this appendix, an inspection critique will be provided using the activity's CO/PWO or their representative prior to departure of the inspection team.

3. Critical deficiencies will be delineated to the using activity. Critical deficiencies are those inspection discrepancies determined by CO NEESA to require immediate attention to preclude major impacts upon reliability of equipment for current operation or redeployment. Using activities will be required to correct critical deficiencies and notify CO NEESA, the using activity's major claimant and the appropriate EFD on a required basis.

4. Technical assistance from the CO NEESA will be provided to using activities upon request as stated in paragraphs B and F of this appendix, and may be used in conjunction with any of the above inspections.

APPENDIX K

>Ch 3 DUERS REPORTING ACTIVITIES

NOTE: In the following, the word "yes" denotes that the activity shall submit the report listed

>Ch 3 Activity	DUERS
Marine Corps Air Station, Cherry Point, North Carolina	Yes
Marine Corps Air Station, El Toro, California	Yes
Marine Corps Base, Camp Lejeune, North Carolina	Yes
Marine Corps Air-Ground Combat Center, Twentynine Palms, California	Yes
Marine Corps Base, Camp Pendleton, California	Yes
Marine Corps Recruit Depot/Western Recruiting Region, San Diego, California	Yes
Marine Corps Recruit Depot/Eastern Recruiting Region, Parris Island, South Carolina	Yes
Marine Corps Logistics Base, Barstow, California	Yes
Marine Corps Logistics Base, Albany, Georgia	Yes
Marine Corps Combat Development Command, Quantico, Virginia	Yes
Marine Corps Base, Camp Smedley D. Butler, Okinawa, Japan	Yes
Camp H. M. Smith, Hawaii	Yes
4th Marine Aircraft Wing, New Orleans, Louisiana	Yes
Marine Corps Air Station, Kaneohe Bay, Hawaii	Yes
Marine Corps Air Station, Beaufort, South Carolina	Yes
Marine Corps Air Station (Helicopter), New River, Jacksonville, North Carolina	1/

1/ Report as part of Marine Corps Base, Camp Lejeune.

Activity	DUERS
Marine Corps Air Station, Iwakuni, Japan	Yes
Marine Corps Air Station, Yuma, Arizona	Yes
Marine Corps Air Station, Futenma, Okinawa, Japan	2/
Marine Corps Air Station (Helicopter), Tustin, California	Yes
1st Marine Corps District, Garden City, New York	Yes
4th Marine Division, New Orleans, Louisiana	Yes
Marine Barracks, Washington, DC	Yes
Headquarters Battalion, HQMC, Henderson Hall, Arlington, Virginia	Yes
Camp Elmore, Norfolk, Virginia	Yes
Sixth Marine Corps District, Atlanta, Georgia	No
Eight Marine Corps District, New Orleans, Louisiana	No
Ninth Marine Corps District, Shawnee Mission, Kansas	No
Twelfth Marine Corps District, Treasure Island, California	No
Defense Finance Accounting Service Kansas City, Missouri	Yes

2/ Report as part of Marine Corps Base, Camp Butler.

ENERGY MANAGEMENT INFORMATION SYSTEMS

1. GENERAL

a. Scope. This appendix describes energy and utilities management information systems administered by the Naval Facilities Engineering Command (NAVFAC) and activity reporting requirements.

b. Definitions. For purposes of this instruction, the following definitions apply:

(1) Host Activity. Provides utilities for themselves and tenants. Their mission is not solely supporting others.

(2) Supporting Activity. Provides utilities to other activities. Their sole mission is to support others.

(3) Tenant Activity. Uses utility services from a host or supporting activity.

(4) Reporting Activities. All activities which are not reported by or included in a host or supporting activity's consumption.

(a) Only activities who deliver (supply) utilities are considered reporting activities. Reporting activities will enter DUERS data to NFESC.

(b) Any tenant activity whose annual consumption exceeds 1,000 mega watt hours (MWh) of electricity or 10,000 MBtu's of any other type of energy may be reported separately under their own UIC (the tenant must have a UIC). All non-appropriated fund activities (e.g., exchanges, clubs and messes, recreation, and welfare activities) and tenant activities not meeting the above requirement will be included as part of the host consumption.

(c) Readiness Commands will consolidate and report consumption of Marine Corps Reserve activities for their regions.

c. Report Synopses

(1) Defense Utility Energy Reporting System (DUERS)

(a) DUERS is a monthly report of shore facilities energy consumption and cost by fuel types and square footage.

This data is the basis for the Energy Audit Report (EAR), and is ultimately transmitted to the Office of the Secretary of Defense where it is used to provide DoD energy data to the Department of Energy and Congress.

(b) The DUERS reporting activity enters the data on-line via microcomputer and modem to the database managed by the Naval Facilities Engineering Service Center (NFESC)

(2) EAR. The EAR displays DUERS data such as the activity's baseline, current monthly and quarterly MWh and MBtu consumption, costs and square footage. The EAR operates on a microcomputer bulletin board system located at NFESC, and is available for viewing and downloading via modem. Management summary reports are also available on the bulletin board. Hard copy reports are only produced upon special request.

(3) Progress Report On Energy Savings At Shore Utilities (PRESS). The PRESS, distributed quarterly, is an extract from the DUERS and includes graphs and tables to help claimants, EFD's, and NAVFAC evaluate the activities' progress toward achieving energy reduction goals. This report is available upon request from NFESC.

2. DUERS

a. Background

(1) Scope. The DUERS report includes energy data for use at all levels of the Navy and Department of Defense (reference DoD 5126.46-N, DUERS). The report provides data on energy consumption and cost for shore facilities and is used to formulate energy policy, correct energy-related problems, and measure energy conservation achievement.

(2) Intent. DUERS is a monthly report. The activity connects via modem to the EAR Bulletin Board System (BBS) and can either enter their DUERS data (energy consumption, cost, and square footage) directly on-line or upload a specially formatted data text file. DUERS is used to develop the EAR.

b. Application

(1) Report period. The DUERS report covers a 30-day period of time to coincide with the utility billing and/or meter reading date. The report is due at NFESC no later than 2400 of the last day of the month following the month to be reported. (For example, the January report is due 28 February, the February report is due 31 March, etc.) If actual data is not available,

an estimate must be provided. Actual data should be entered as soon as available.

(2) Reported Data

(a) Consumption. Report all shore utility energy consumption for which the Marine Corps has procurement responsibility including reimbursables. Energy consumption to be reported is to be "source" energy or the total "used" fuel quantity and purchased electricity quantity directly from the commercial bill.

(b) Costs. Report the "as burned" or "as consumed" cost to the nearest dollar from NAVCOMPT Form 2127 (UCAR). For fuel oil use the stock fund price. For purchased utilities use the commercial cost (including demand charges) as shown in the bills. (The quantity and cost billed your activity by a commercial company should be verified against installation meter readings.)

(c) Square Footage. Report building square footage monthly in thousands of square feet. To reflect accurate energy progress, activities must update their square footage. Square footage is reported only for enclosed buildings. Square footage of demolished buildings should be deleted from the current KSF but remain in the FY85 baseline. Buildings that qualify for inclusion are:

1 A class 2 building in the Naval Facilities Assets Database (NFADB) owned or leased by the Marine Corps.

2 A class 2 building in the NFADB in caretaker excess status but still owned by the Marine Corps.

3 An enclosed structure serviced by utilities (e.g., magazines), whether or not in the NFADB.

4 A portable or relocatable building (e.g., a trailer) whether or not in the NFADB.

5 Leased buildings not in the NFADB such as GSA owned buildings, commercial buildings and buildings owned by other DoD government services. The consumption and square footage for leased buildings must be reported in the DUERS when the type of utilities, usage, and cost can be identified. (Commercial utility bills will be received for these buildings.) However, leased buildings are not reported if the utilities are included as part of the cost of the lease.

6 If it is believed to be impractical to significantly reduce the energy consumption of a building or

group of buildings, the installation commander may forward a request for exemption to the CMC (LFF) including a detailed justification for the request. If approved, the square footage and energy consumed by these facilities will be reported separately as exempt.

(d) Number of Owned Buildings. Total number of owned buildings whose energy is reported in the DUERS. Sterile buildings (buildings not in regular use, not consuming any energy, or awaiting demolition) or buildings maintained in "caretaker" condition throughout the year with only minimal security lighting should not be counted.

(e) Number of Leased Buildings. Total number of energy consuming buildings rented or leased from any organization or party outside of the DoD, if the energy is paid for directly by DoD Component.

(3) Corrections to DUERS. Corrections to the current quarter and to the previous quarter can be made by the activity directly into the DUERS database on the NFESC MICRO-EAR bulletin board. Corrections required to data other than the current and previous quarter must be submitted to NFESC via letter, fax, or E-mail on the MICRO-EAR system.

(4) Changing Baseline. There will be no baseline changes except in the case of a reorganization or a realignment. All changes to energy usage and square footage baselines must be justified by the activity and approved by NFESC. A detailed, written request must be submitted through the CMC (LFF) to NFESC for approval.

c. Host Reporting Activity Responsibilities

(1) Reporting. To avoid duplication or loss of energy consumption data, the host activity is responsible for ensuring that all energy data are reported.

(2) Maintain Current UIC's

(a) Adding an Activity. To add an activity, a request through the CMC (LFF) to NFESC for approval is required. The letter must show monthly energy consumed, by type, in their first year of operation and show related square footage.

(b) Deleting an Activity. To delete an activity, send a letter through the CMC (LFF) to NFESC informing them of the date of disestablishment.

(c) Realigning or Reorganizing an Activity. For realignment and reorganization of activities, send a letter

through the CMC (LFF) to NFESC indicating the amount of square footage transferred from one UIC to another and the quarter in which this change becomes effective.

d. UIC prefixes. The UIC in the report must be preceded by the appropriate letter prefix. Each product used will be reported only once for each UIC.

(1) "M" - Represents energy data for Marine Corps shore activities.

(2) "K" - Represents energy data for Marine Corps activities' family housing facilities.

(3) "S" - Represents energy consumed by operational trainers and the facilities that contain them. For example, fire fighting trainers and flight simulators may be reported separately. Use the activity's UIC preceded by the letter "S" to identify the trainer's energy consumption. Consumption must be separately metered or have an accurate estimate. A request to NFESC, with a copy to the CMC (LFF), is required and must be approved before reporting. This request must include square footage and consumption for FY85 baseline data. This same square footage and consumption must be deleted from the activity's baseline if it was originally included.

(4) "C" - Represents fuel used to generate electricity in cogeneration systems. Energy above 3413 Btu per kWh of electricity has to be allocated to the Host or Support Activity to not punish the customer for inefficiencies in production. The excess fuel consumption will be reported using the activity's UIC preceded by the letter "C." A request to NFESC, with a copy to the CMC (LFF), is required and must be approved before reporting. All remaining fuel consumption will be allocated among the reporting UIC's based on their actual consumption in the normal manner.

(5) "X" - Represents miscellaneous energy consumed and related square footage by non-defense activities; private parties; contractors; and state, local and foreign governments. Miscellaneous energy consumption will be reported using the prefix "X". Consumption must be metered or have an accurate estimate. A request to NFESC, with a copy to the CMC (LFF), is required and must be approved before reporting. This request must include square footage and consumption for FY85 baseline data. This same square footage and consumption must be deleted from the activity's baseline. Private parties, such as credit unions and McDonald's, and utilities used by contractors that are metered and billed by the Navy should also be reported under the miscellaneous category.

(6) "G" - Represents Government-owned and contractor-operated (GOCO) activities. GOCO must comply with monthly DUERS reporting requirements

e. Comparison with UCAR

(1) The DUERS report must be consistent with the Utilities Cost Analysis Report (UCAR) 5ystem per volume III chapter 7, of the NAVCOMPT Manual

(2) Table L-l contains points of reconciliation for which should be used to purchased electricity and natural gas ensure comparability of data reported in DUERS and the consolidated UCAR.

(3) Table L-2 contains points of reconciliation for each fuel type (other than natural gas) included in the DUERS report which should be used to ensure comparability of data reported in DUERS and the consolidated UCAR

(4) Heat content for the fuel consumed is included in NAVCOMPT Form 2127. The standard units and conversion factors found in table L-3 will be used when actual heat content is not available. The cognizant EFD should be contacted for assistance and guidance.

f. Report Format. Submit the DUERS reports in the manner prescribed in DOD 5126.46-M-2, DUERS, dated November 1993

TABLE L-1.--POINTS OF RECONCILIATION (PURCHASED ELECTRICITY AND NATURAL GAS).

DUERS	UCAR
Electricity Consumption	Column C, Line 12
Electricity Cost	Column C, Line 30
Unit Cost (Cost/Consumption)	Column C, Line 40
Natural Gas Consumption	Column B, Line 12
Natural Gas Cost	Column B, Line 30
Unit Cost (Cost/Consumption)	Column B, Line 40

TABLE L-2.-- (FUELS, EXCLUDING NATURAL GAS).

DUERS	UCAR
Fuel Consumption (Excluding Natural Gas)	Total MBtu's Column, Line 1 for each Fuel Type
Fuel Cost (Excluding Natural Gas)	Total Dollars Column, Line 1 for each Fuel Type
Unit Cost (Cost/Consumption) (Excluding Natural Gas)	Unit Cost per MBtu Column, Line 1 for each Fuel Type

TABLE L-3.--HEAT CONTENT CONVERSION FACTORS.

PRODUCT	HEAT CONTENT (M = MILLION)
Purchased Electricity (ELC)	3,413 Btu/kilowatt hour (kwh)
Natural Gas (NAG)	103,100 Btu/cubefoot (ft3)
Propane/LPG/Butane (PPG)	95,500 Btu/gallon (20,000 Btu/pound)
Fuel Oil, Mixed (FSX)	6.0 MBtu/barrel
Fuel Oil, Distillate (FSD)	5.825 MBtu/barrel
Fuel Oil, Residual (FSR)	6.287 MBtu/barrel
Bituminous Coal (COL)	24.58 MBtu/short ton (2,000 pounds)
Anthracite Coal (ANC)	25.4 MBtu/short ton
Purchased Steam/Hot Water (SHW)	MBtu content varies with temperature & pressure
Coke (COK)	25.38 MBtu/short ton
Photovoltaic (PHO)	3,413 Btu/kWh
Solar Thermal (SOL)	1,000,000 Btu/MBtu
Wind Power (WND)	3,413 Btu/kWh
Wood (WUD)	17,000 Btu/short ton
Geothermal Heat (GEO)	1,340 Btu/pound of steam delivered
Geothermal Electricity (GLC)	3,413 Btu/kWh
Refuse Derived Fuel (RDF)	6.0 MBtu/short ton
Hydroelectric (HYD)	3,413 Btu/kWh
Reclaimed Fuel Oil (FOR)	5.0 MBtu/barrel

NOTE: Commercially purchased electricity will be reported in MWh. To develop activity total energy baseline usage and consumption, MWh of commercially purchased electricity are multiplied by a factor of 3.413 MBtu/MWh. NFESC converts MWh to MBtu for graphs.

> APPENDIX M

ACQUISITION OF DIRECT SUPPLY NATURAL GAS

A. PROGRAM RESPONSIBILITIES

1. CMC (LFF): In cases where DFSC and the Marine Corps cannot reach agreement, the CMC (LFF) will coordinate resolution.

2. Defense Logistics Agency/Defense Fuel Supply Center (DFSC):

a. Serves as the single manager for acquisition of direct supply natural gas for Defense installations. This responsibility encompasses the consolidation of installations' natural gas requirements as submitted by the installations, economic analysis of various supply options, solicitation for acquisition of direct supply natural gas supplies and transportation to the designated delivery point, gas storage (if determined advantageous), and (when agreed to by both the Military Departments and DFSC) central nominating, balancing, and payment of invoices to the DFSC contractor.

b. Determines the availability of direct supply natural gas and pipeline transportation to reduce energy costs, and solicits, awards, and manages supplies under contract for the acquisition and transportation of direct supply, natural gas to the "citygate" or "burner tip," as may be agreed with the installations. DFSC will work with suppliers, interstate pipelines, and LDC's to increase opportunities for the acquisition and delivery of direct supply natural gas.

c. Provides periodic reports to the military departments outlining the status of each centralized acquisition of natural gas and pipeline transportation.

d. Arranges regional training for the military departments for the centralized acquisition of direct supply natural gas.

e. Monitors gas market and industry trends and provides reports to the military departments on significant issues.

f. Notifies the military departments of any potential for rate intervention identified during centralized direct supply natural gas procurement activities.

g. Contracts LDC's to provide nonutility service direct supply natural gas to a using installation, if this proves to be

the most cost effective method of supplying natural gas to that installation.

3. Engineering Field Divisions of the NAVFACENGCOM, as appropriate:

a. Forward natural gas requirements for both interruptible and firm gas supply to DFSC, including any special or installation specific requirements or constraints, such as special service arrangements with the LDC, which may need to be identified in a solicitation.

b. Maintain the installation/LDC relationship regarding transportation of the natural gas from the citygate to the burner tip, when the DFSC contracts specify delivery to the LDC citygate.

c. Maintain the LDC gas utility service contract when the LDC delivered cost of gas is less than the DFSC direct supply natural gas cost delivered to the burnertip, taking into account appropriate gas supply, transportation and administration cost (including any surcharges).

d. Ensure LDC transportation agreements are in effect at installations where DFSC contracts specify delivery to the LDC citygate, prior to the initial delivery start date as specified in the DFSC direct supply natural gas contracts.

g. Gather and provide to DFSC annual installation administrative costs associated with performing preaward and postaward functions by November 15 of each year for incorporation in the annual DFSC report.

B. CONTRACTING PROCESS

1. Procedural Summary

a. DFSC will solicit and award contracts for both interruptible and firm natural gas supply based on the type of natural gas requirements submitted by the military departments.

b. The requirement for an installation to participate in the DFSC program and place orders against the signed contract will be based on the economic analyses performed by DFSC. DFSC and the military departments will jointly review these analyses to determine if the DFSC contract is the best method to achieve maximum overall savings for the length of the contract delivery period.

c. Economic analyses will be conducted for each installation in three stages as follows:

(1) Prior to submission of requirements, DFSC will conduct a screening to eliminate service territories and installations that on first appearance are unsuitable.

(2) Prior to inclusion of requirements in the DFSC solicitation, a computation will be done by DFSC, to include all appropriate gas supply and cost factors submitted by the installations, and market data available to DFSC. This economic analysis of gas supply options will be jointly reviewed by DFSC and appropriate military department representatives.

(3) At the time of initial offers, the offered price will be used by DFSC to update the analyses in paragraph (2), above.

d. Installations will not be included in the DFSC solicitation if the stage 2 analysis indicates negligible or improbable cost savings. If included in the solicitation, installations will be withdrawn if the economic analyses performed by DFSC after receipt of initial offers (at stage 3) indicate negligible or improbable cost savings. In unusual cases where there are no cost savings for an individual installation at time of "best and final offers" (BAFO's), DFSC, and the affected military departments will determine the best course of action for the government, since other installations may be adversely affected by the potential withdrawal of an installation this late in the acquisition process.

e. Requirements submitted to DFSC must designate whether a contract for firm or interruptible gas supply is requested. For those requirements for interruptible gas, where monthly switching is permitted between "sales" and "transportation" gas by the LDC, the most economic source of gas on a month by month basis will be utilized. This cost comparison will be accomplished by DFSC comparing the projected DFSC contractor price for the coming month to the published LDC tariff price for the coming month.

f. For those requirements for both firm gas, and for interruptible gas where monthly switching is not permitted between "sales" and "transportation" gas by the LDC, the economic analyses performed in stages 1 through 3 above will determine if the installation will participate in the DFSC direct supply natural gas contracting process. Once a contract is awarded, the installations will be required to place orders under the direct supply natural gas contract even if the LDC subsequently lowers its price for the mandatory contract delivery period. DFSC will not award "take-or-pay" contracts in which the installation must pay a penalty if they have no requirement for gas. However, transportation pipeline capacity reservation/demand charges will apply for firm contracts.

g. The retail purchase relationship between the installation and their current LDC will be maintained when the DFSC contract specifies delivery of the natural gas to the LDC citygate.

2. Step-by-Step Process--Before Solicitation

a. DFSC will notify the Service Utilities Management Offices (SUMO) of the area to be solicited and request basic data necessary for solicitation. Within the Department of the Navy, NAVFACHQ is the SUMO and will be the point of contact for policy matters. However, SUMO responsibility for technical issues for Navy and Marine Corps installations is delegated to NORTHNAVFACENGCOM. SUMO responsibility for contract management matters is delegated to EFD's.

b. EFD's are responsible for reviewing installation requirements and advising DFSC if inclusion in the proposed DFSC Request for Proposal (RFP) would adversely impact any ongoing or planned LDC rate intervention activity, demand side management programs or LDC investment programs, or if any changes are anticipated in the LDC rate structure which would impact on the decision to include the installation in the DFSC solicitation. EFD's should also advise DFSC of any installations to be affected by planned base realignment and consolidation plans or, on an installation basis, of any technical changes in future natural gas requirements or energy systems serving those specific requirements.

c. EFD's provide installation specific data to DFSC in accordance with the guidelines of the published DFSC natural gas acquisition schedule. Submission of this data will be in accordance with instructions provided by DFSC, but will generally require the following items:

(1) Indication of LDC willingness to transport natural gas and the applicable rate schedules.

(2) Identification of the terms, conditions and renewal date (5), if any, for existing direct supply natural gas contracts.

(3) Monthly historical gas use that is appropriate for interruptible and/or firm service requirements; peak day load for interruptible service, if available; maximum daily quantity for firm service, if available.

(4) Alternate energy sources and current cost.

(5) POC's at each activity - Name and address of ordering office, invoice receiving office, payment office and contracting office.

(6) Specific technical criteria, if unique to a particular installation, to be included in the DFSC solicitation.

d. EFD's initiate, or ensure that the installation initiates, a formal agreement with the LDC for transportation of the contract gas volumes, when the DFSC contract specifies delivery of the natural gas to the LDC citygate, and provide appropriate tariff rates to DFSC. This LDC transportation agreement must be formalized and in place prior to the anticipated contract delivery date.

e. DFSC will develop an economic analysis of the gas supply options.

f. DFSC and the Military Departments conduct a joint review of the economic analysis to determine which installations will participate in the acquisition process.

g. DFSC incorporates data into a solicitation package and solicits. Copies of the DFSC solicitation package will be provided to each Military Department.

3. Step-byStep Process--After Solicitation

a. Upon receipt of initial offers, DFSC will review the economic implications for all participating installations and advise the Military Departments of any installations that should be removed from the solicitation based upon a lack of cost savings opportunities.

b. The Military Departments will participate in the review of the technical information submitted as part of the proposals offered in response to the DFSC direct supply natural gas solicitation to determine those offerors which are technically qualified.

c. DFSC will advise the Military Departments of any installations that reflect no cost savings, and the apparent economic impact on those installations and all others in the contract package if the noneconomic installations were withdrawn at this time, at the time that "best and final offers" are evaluated. A coordinated decision will be made by DFSC and the affected Military Departments as to the course of action to follow in instances of this nature. At this late stage in the acquisition process, installations will be deleted from the DFSC solicitation on an exception basis only.

d. Prior to the planned gas delivery date, DFSC is responsible for making a regional training course available to installation personnel to enable them to carry out their contract support responsibilities.

e. The Military Departments will assure that personnel at all installations participating in the program are sufficiently trained to carry out their responsibilities.

4. Step-by-Step Process--After Award of the Contract.

a. Installation personnel will issue contract delivery orders and nominations, receipt for gas and pay contractor invoices, unless otherwise agreed upon by DFSC and the Military Departments (as is the case in California where DFSC handles these functions with the DFSC contractor, and the installations reimburse DFSC for these applicable costs.)

b. Each installation covered by the contract will make monthly nomination of gas quantities based on projected gas consumption during the subsequent month. If they order gas from the DFSC contract, installations are responsible for making sure that they do not order more than they use in the subsequent month or, if they do, they make it up in the balance period specified in the contract with the LDC, or they pay the resultant penalty, if any.

c. Installations will maintain their relationship with their current LDC, when the DFSC contract specifies delivery of the natural gas to the LDC citygate, when the LDC allows switching, or when the installation is buying gas under a contract with the LDC. For interruptible and/or firm transportation contracts, natural gas service and backup, if appropriate, will be obtained from the LDC under tariff rates, terms, and conditions. Determining which gas to order will be based on comparison of the DFSC unit price for direct supply natural gas delivered to the burner tip (with surcharge and including the cost of backup service if appropriate, to the LDC's tariff unit price of gas in effect and available at the time the monthly nomination must be made to the DFSC contractor.

d. Installations will furnish DFSC, and their SUMO copies of each delivery order and invoice, and immediately notify DFSC of any gas supply or contract problems.

e. DFSC is responsible for direct supply natural gas contract administration and for assuring that the contractor fulfills its contract obligations; e.g., to deliver nominated quantities of gas to the designated delivery point at the rate contracted.

5. Natural Gas Contracting Transition

a. The Military Departments will submit requirements to DFSC for installations which have contracts expiring (this includes expiration of the basic contract delivery period or any option year delivery period) during the forthcoming DFSC contract period. The delivery period for those installations stated in the DFSC contract will coincide with the expiration date of the existing contracts. Installations in the region to be solicited that have existing long-term contracts that are not due to expire (basic contract or option year delivery periods) will not be provided for inclusion in the DFSC market survey and analysis.

b. Existing direct supply natural gas contracts will continue to be processed up to the first renewal option, if such option exists, until and unless formally turned over to DFSC. Requirements for installations which have existing contracts with option renewal periods will be submitted to DFSC in accordance with the DFSC direct supply natural gas acquisition schedule prior to exercising each contract extension option. An economic analysis will be conducted by DFSC and jointly reviewed by the military departments and DFSC to determine whether to include the installation(s) in the DFSC solicitation or to exercise the extension provisions for the existing contract. Detailed operating arrangements will be negotiated as necessary and approved at the working level offices.

C. DEFINITIONS

1. Burner Tip: The point in an installation natural gas system at which the natural gas is actually consumed.

2. Citygate: The point in the natural gas transmission system at which the local distribution company (LDC) receives wholesale gas deliveries.

3. DFSC Surcharge: A pro rata administrative surcharge reflecting the operational, general and administrative costs incurred by DFSC for their operation of the direct supply natural gas program.

4. Direct Supply Natural Gas Contracting: Contracting under a single manager process that aggregates the requirements of various customers for competitive acquisition.

5. Firm Natural Gas Contracts: As referred to in this document, firm natural gas contracts are those which require

delivery of a specified quantity of supply. Pipelines reservation (demand) charges for firm natural contracts are paid (whether natural gas is delivered or not) based upon an established maximum daily quantity (MDQ) of natural gas that the pipeline has agreed will be delivered to a firm transportation customer serviced by the pipeline.

6. Interruptible Natural Gas Contracts: Interruptible natural gas contracts are those in which the delivery of natural gas may be curtailed or interrupted (usually with some advance notice) based upon pipeline capacity limitations. Curtailments of this nature are more prone to occur during peak demand time frames.

7. LDC Backup and Standby Charges: Charges imposed by an LDC to a transportation service customer for the purpose of providing backup and standby services.

8. Monthly Switching: The process in which a local distribution company (LDC) allows customers to switch sources of natural gas supply, on a monthly basis, between the LDC "sales" gas or another supplier’s "transportation" gas.

9. Sales Gas: In relation to a local distribution company (LDC), that gas obtained by a customer directly from the LDC under established tariff rates.

10. TransDortation Gas: In relation to a local distribution company (LDC), that gas obtained by a customer from another source and/or supplier that is allowed to be transported over the LDC’s distribution system.

>Ch 3 APPENDIX N

SECNAV ENERGY CONSERVATION AWARDS PROGRAM EVALUATION CRITERIA FOR AVIATION SQUADRONS

A. Selection Criteria for Aviation Squadrons. Each section of the nomination shall represent one of the eight selection criteria, which have been weighted according to their overall importance. The nominations must respond to each of the eight criteria. "Not Applicable" is an acceptable response and, with sufficient explanation, will not be penalized.

1. SECTION 1. Total Energy or Water Saved (14 Points) State the amount of energy or water saved by the project in the past fiscal year compared to the previous fiscal year. Express both the absolute amount of energy or water saved in MBtu's or Kgal and the incremental percentage change relative to the previous year. If precise data is unavailable, use best estimates and indicate the basis for the estimates.

2. SECTION 2. Descriptions of Action(s) Taken (12 Points). Provide a detailed description of the action(s) taken to achieve the savings identified in SECTION 1. Include an explanation, where applicable, of:

a. Technical efforts.

b. organizational changes.

c. Degree to which nominee got others actively involved.

d. Hardware changes.

e. Conservation information/awareness efforts.

f. Institutional or bureaucratic changes made.

g. Other

3. SECTION 3. Project Life (12 Points). Provide an estimate of how long the energy or water conservation actions are expected to stay in effect and estimate the continuing annual savings.

4. SECTION 4. Transferability (12 Points). Provide an assessment of the project's potential applications outside the nominee's organization. Describe results of implementing the action elsewhere and/or documentation of the project for use by other government agencies.

5. SECTION 5. Innovation (12 points). Describe innovative features that make the action unique.

a. List and describe each feature.

b. Describe the benefits of the innovative features (i.e., technical, educational, economic). Quantify the results and the method of measurement.

6. SECTION 6. Energy or Water Saved Compared to Dollars Spent (8 Points). Divide the total number of MBtu's or Kgal saved by the total number of dollars spent for the project. Include all future savings and future dollar expenditures (capital, O&M, salvage, replacement, etc.) associated with the energy conservation actions. Express future dollar expenditures in current base year dollars. Indicate the basis for estimates.

7. SECTION 7. Outreach and Education (6 Points). Describe any educational and/or outreach components of the action.

a. Describe the features of the educational or outreach component.

b. Describe the subject areas covered by this project.

c. State the methodology and/or techniques used for determining the improvements in user behavior. Indicate any follow-up provided and/or survey technique.

8. SECTION 8. User Behavior (6 Points). Describe positive, long-term effects on the energy consumption patterns of a target audience. State the type and size of the target audience and methods influencing the behavior change.

B. Scoring. The scores awarded for each criteria will be totaled and divided by the total possible score for applicable sections, giving a percentage score.