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UNIFIED FACILITIES CRITERIA (UFC)

OPERATION AND MAINTENANCE: INACTIVE CARE AND CLOSURE OF SHORE FACILITIES

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UNIFIED FACILITIES CRITERIA (UFC)

OPERATION AND MAINTENANCE: INACTIVE CARE AND CLOSURE OF SHORE FACILITIES

U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEERING SUPPORT AGENCY

Record of Changes (changes indicated by **1**\ ... /**1**/)

Change No.	Date	Location

FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States is also governed by Status of forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA.) Therefore, the acquisition team must ensure compliance with the more stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Support Agency (AFCESA) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request (CCR). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide web site http://dod.wbdg.org/.

Hard copies of UFC printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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CHAPTER 1

INTRODUCTION

1-1 **PURPOSE AND SCOPE**. This UFC is comprised of two sections. Chapter 1 introduces this UFC and provides a listing of references to other Tri-Service documents closely related to the subject. Appendix A contains the full text copy of the previously released Military Handbook (MIL-HDBK) on this subject. This UFC serve as criteria until such time as the full text UFC is developed from the MIL-HDBK and other sources.

This UFC provides general criteria for operation and maintenance consisting of inactive care and closure of shore facilities.

Note that this document does not constitute a detailed technical design, and is issued as a general guide associated with operation and maintenance consisting of inactive care and closure of shore facilities.

1-2 **APPLICABILITY**. This UFC applies to all Navy service elements and Navy contractors; Army service elements should use the references cited in paragraph 1-3 below; all other DoD agencies may use either document unless explicitly directed otherwise.

1-2.1 **GENERAL BUILDING REQUIREMENTS**. All DoD facilities must comply with UFC 1-200-01, *Design: General Building Requirements*. If any conflict occurs between this UFC and UFC 1-200-01, the requirements of UFC 1-200-01 take precedence.

1-2.2 **SAFETY**. All DoD facilities must comply with DODINST 6055.1 and applicable Occupational Safety and Health Administration (OSHA) safety and health standards.

NOTE: All **NAVY** projects, must comply with OPNAVINST 5100.23 (series), *Navy Occupational Safety and Health Program Manual*. The most recent publication in this series can be accessed at the NAVFAC Safety web site: www.navfac.navy.mil/safety/pub.htm. If any conflict occurs between this UFC and OPNAVINST 5100.23, the requirements of OPNAVINST 5100.23 take precedence.

1-2.3 **FIRE PROTECTION**. All DoD facilities must comply with UFC 3-600-01, *Design: Fire Protection Engineering for Facilities*. If any conflict occurs between this UFC and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence.

1-2.4 **ANTITERRORISM/FORCE PROTECTION**. All DoD facilities must comply with UFC 4-010-01, *Design: DoD Minimum Antiterrorism Standards for Buildings*. If any conflict occurs between this UFC and UFC 4-010-01, the requirements of UFC 4-010-01 take precedence.

1-3 **REFERENCES**. The following Tri-Service publications have valuable information on the subject of this UFC. When the full text UFC is developed for this

subject, applicable portions of these documents will be incorporated into the text. The designer is encouraged to access and review these documents as well as the references cited in Appendix A, MIL-HDBK 1130.

1. US Army Corps of Engineers
Commander
USACE Publication Depot
ATTN: CEIM-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
(301) 394-0081 fax: 0084
karl.abt@hq02.usace.army.mil
http://www.usace.army.mil/inet/usace-docs/

USACE TM 5-610, Preventative Maintenance for Facilities Engineering, Buildings and Structures, 01 November 1979
USACE TM 5-617, Facilities Engineering: Maintenance and Repair of Roofs, 30 January 1974

USACE TM 5-620, Facilities Engineering: Maintenance and Repair of Architectural and Structural Elements of Buildings and Structures, 19 May 1990
USACE TM 5-622, Maintenance of Waterfront Facilities, 01 June 1978

APPENDIX A

MIL-HDBK 1130
OPERATION AND MAINTENANCE: INACTIVE CARE AND CLOSURE OF SHORE FACILITIES

INCH-POUND

MIL-HDBK-1130
31 DECEMBER 1991
SUPERSEDING
NAVFAC MO-300
August, 1990

MILITARY HANDBOOK

INACTIVATION, CARETAKER MAINTENANCE, REACTIVATION, AND CLOSURE OF SHORE FACILITIES

AMSC N/A

AREA FACR

ABSTRACT

This handbook provides information about inactivating, closing, reactivating, or providing caretaker maintenance to individual facilities, groups of facilities, or whole bases. The handbook provides general guidelines and points for consideration, but is not intended as a detailed plan for every individual activity.

FOREWORD

This handbook establishes basic standards and procedures for Public Works management, planning, and maintenance personnel involved with inactivating, closing, reactivating, or providing caretaker maintenance at Navy shore facilities.

Recommendations for improvement are encouraged from within the Navy, other Government agencies, and the private sector and should be furnished on the DD Form 1426 provided inside the back cover to Commander, Northern Division, Naval Facilities Engineering Command, Code 164, Philadelphia, PA 19112-5094; telephone commercial (215) 897-6688.

THIS HANDBOOK SHALL NOT BE USED AS A REFERENCE DOCUMENT FOR PROCUREMENT OF EQUIPMENT. IT IS TO BE USED AS A GUIDE TO ESTABLISH MAINTENANCE PROCEDURES IN FOOD SERVICE FACILITIES. DO NOT REFERENCE IT IN MILITARY OR FEDERAL SPECIFICATIONS OR OTHER PROCUREMENT DOCUMENTS.

INACTIVATION, CARETAKER MAINTENANCE, REACTIVATION, AND CLOSURE OF SHORE FACILITIES

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Section 1: INTRODUCTION

1.1 Purpose and Scope. This handbook is a guide for public works management, planning, and maintenance personnel involved with inactivating, closing, reactivating, or providing caretaker maintenance to individual facilities, groups of facilities, or whole bases. The handbook provides general guidelines and points for consideration, but it is not intended as a detailed plan for every individual activity. Using information from this handbook and other sources, shore activities should develop a plan of action and milestones (POA&M) tailored to the specific activity. When inactivating, closing, or reactivating involves many facilities and affects large numbers of personnel, a more formal planning process is required. It is usually appropriate to prepare a formal Master Plan (OPNAVINST 11000.16, Command Responsibility for Shore Activity Land and Facilities), or revise the existing Master Plan to help document facility needs.

1.2 Cancellation. This handbook supersedes MO-300, Inactivation, Caretaker Maintenance, Reactivation, and Shore Facilities, dated August 1990.

1.3 Definitions. The following sections address the meaning of, and differences among, the terms “inactivation,” "caretaker maintenance," “reactivation,” and “closure” as used in this handbook. A good understanding of the differences in usage is important to gain full appreciation of the technical sections that follow.

1.3.1 Inactivation. Inactivation means temporarily shutting down a building, facility, or whole base with the long-term intent of using the asset in the future. Inactivating is equivalent to “mothballing.” In the inactivation process, a facility is vacated, secured, and made weather-tight. Afterward, it is inspected on a regular basis per MO-322, Inspection of Shore Facilities and Appendix A, and maintained for preservation. The key point to remember is that inactivated facilities are not just locked and then ignored. They require the investment of resources over time for maintenance to allow future reactivation. If future needs cannot be identified, than closure would seem more appropriate than inactivation with caretaker maintenance.

1.3.2 Caretaker Maintenance. Caretaker maintenance refers to the level of maintenance performed on an inactivated facility to preserve its weather tightness, security, and protection from fire, rodents, birds, or human damage. Additionally, caretaker maintenance includes performing those tasks necessary to keep an inactivated facility aesthetically acceptable when it is located among other active facilities. Tasks performed for caretaker maintenance are very similar to those performed in active buildings; only the degree and frequency may vary. Maintenance should be provided on a cyclic basis as for active buildings. For example, roof repair or replacement is required periodically, whether the facility is occupied or inactive. Exterior

painting on inactive facilities will be required, but probably not at the same frequency as for active facilities. Interior painting will likely never be required as long as a facility remains inactive.

1.3.3 Reactivation. Reactivation involves those actions necessary to prepare an inactivated building for occupancy. Reactivation will require a thorough clean-up and painting of the facility interior, as a minimum. It may require considerably more efforts depending on the length of time the facility has been inactive and the level of caretaker maintenance performed by the activity. For industrial or training facilities, reactivation will require depreserving or reinstalling equipment. For administrative or personnel support facilities, reactivation will likely require the provision of new furnishings as well as a thorough cleaning. A part of reactivation will be inspection by fire department, preventive medicine, and safety personnel.

1.3.4 Closure. Closure involves shutting down and securing a facility until the activity can demolish or transfer it to another agency. Closed facilities receive virtually no inspection or maintenance. Once the decision is made to close vice inactivate a facility, avoid any expenditure of resources *on* the facility. Undertake only those tasks necessary to ensure safety, provide security, and prevent damage to nearby facilities. Closure can apply to one facility on an active base or to all facilities when the Navy closes a whole base. Immediate action should be taken to excess the facility.

1.4 Responsibility

1.4.1 Major Claimant. The major claimant's responsibility in the inactivation/closure/reactivation process is very similar to its role in dealing with a fully operational shore activity. The major claimant should establish the mission, provide policy direction, and provide the resources (personnel and dollars) to support whatever inactivation, closure, or activation actions are needed. Where whole bases are inactivated and maintained in a caretaker status, the major claimant should make sure that an appropriate management and maintenance organization remains in place and that adequate caretaker status funds are provided. This will protect the Navy's interest and investment in an activity in caretaker status.

1.4.2 Engineering Field Division (EFD). The NAVFAC EFD plays several roles in the inactivation/closure/caretaker maintenance/reactivation process. The EFD Real Estate Division is responsible for real estate matters involving:

a) The termination of in-grants and out-grants (leases, licenses, permits, etc.) that affect the activity.

b) Internal screening of excess property.

c) Excessing of property to the General Services Administration (GSA).

d) Transfer of real property to other military departments.

e) Issuance of permits or licenses to other federal agencies, private parties, or other military departments within the Department of Defense for the interim use of the activity's real property pending disposal by GSA.

If it is determined that property is no longer needed, the EFD should coordinate the internal screening of the property to determine if another Navy activity has a need for the property. The EFD will also prepare the subsequent Title 10 disposal report.

The EFD is responsible for the preparation of the necessary Reports of Excess Real and Personal Property to facilitate transfer of Class I (land) or Class II (facilities) property to another military department or to report it as excess to the GSA for disposal. Additionally, EFD personnel provide assistance to the claimant or activity in developing facilities activation/reactivation plans; developing caretaker maintenance plans, schedules, or standards; and determining public works staffing requirements.

Finally, the EFD can be of major assistance in dealing with environmental issues surrounding inactivation, closure, or reactivation.

1.4.3 Activity Public Works Department (PWD). The PWD will expend most of the effort required to inactivate or close facilities. A key concern is that, in a major inactivation or closure, the PWD will be phased down along with other departments. The right skills may not be available for the duration of the inactivation/closure effort. Additionally, when pending inactivation or closure becomes public knowledge, PWD personnel will begin to look for other employment. Employees remaining to the end will have limited incentive to produce. This will further dilute capability to accomplish all necessary action.

Developing a caretaker organization as early as possible and taking action to identify staffing for this organization will help provide a more stable work force. This will provide a variety of workers whose future is stable and who are more likely to produce to normal management expectation. Contracting for the inactivation and caretaker organizations may be an useful alternative in some situations.

The PWD will have to focus on inactivation/closure of facilities throughout the base. Additionally, the PWD will have to undertake the more intensive effort to deactivate public works-controlled shops, administrative space, and utility plants. Depending on the shore activity, the PWD may be more or less involved in mothballing, removal, and transfer of equipment and furnishings in non-PWD facilities. However, PWD is clearly concerned with these same items in buildings, shops, and utility plants controlled by the PWD. The PWD will also have to transfer, mothball, or dispose of USN-numbered

transportation equipment; advise the Officer in Charge of Construction (OICC) or Officer in Charge (OIC), NAVFAC Contracts, to terminate or modify utility sales, facility support, and construction contracts; and make sure appropriate Class I and II property records are up to date.

1.4.3.1 Closure milestones. Closure milestones for plant property include establishing a deactivation date(s), updating the inventory plant account, preparing the inactivation plan and checksheets, and inactivating the facility. Among the principal tasks to be performed in accordance with planned schedules are the following:

a) Inventory property and make recommendations for its assignment to the inactivation category or for disposal.

b) Prepare and issue job orders and procedures.

c) Identify shop or contract accomplishment.

d) Inspect, survey, package, ship, and transfer excess material.

e) Analyze utility requirements and alter or modify systems.

f) Inspect and secure inventory.

g) Adjust plant inventory.

h) Transfer plant account.

1.4.3.2 Inspection. A documented, comprehensive inspection should be performed with the inspection team being responsible for the verification of plant account records and for all accountable property being assigned to the responsible individual. The inspection team should also provide an up-to-date Type A annual inspection summary, which will indicate the plant condition. The work to be accomplished will be determined by whether the activity goes into an inactive mobilization status or whether the property will be surveyed and disposed of. The officer in charge should determine the inactive status for each facility based on the required degree of military readiness and the guidelines presented in Table 1. Property to be sold or leased should be maintained in an active or standby status.

A checkoff sheet should be developed which will list the work for securing the building and the equipment that should be removed. After the building has been emptied, it is turned over to the public works officer. The building should not be accepted until all personal property/equipment in the building is transferred. The maintenance foreman, using the checkoff sheet, will accomplish the work necessary before securing the building.

Table 1
Guidelines For Status of Inactivation

CLASSIFICATION	INACTIVE	STANDBY	RESERVE	ABANDONED/ CLOSED
Physical condition	Ready for use	Preserved unused standby	Cannibalized minimal upkeep	Unusable
Reactivation time	O to 72 hours	60 to 90 days (2)	12 to 18 months (2)	None, replace
Length of in-activity (3)	0-3 years	3-5 years	5-7 years	Permanent
Operational status (1)	Maintenance	Partial maintenance	Inactive	Dis-establish (Surplus)
Level of maintenance (4)	A	B	c	D
Inspection category (1) and frequency	Qtrly PM, control insp. as required	Control inspection annually	Control inspection annually	See para. 1.3.4

(1) Reference: NAVFAC MO-322, Vol. 1.
(2) In some cases long lead time items such as major equipment purchase (repair, or replacement) may require additional time.
(3) An economic analysis should be prepared to determine the breakeven economic life for the facility. This should be used when determining the length of inactivation.
(4) Level of Maintenance:
A Maintain economically to ensure full safe and efficient support and to fulfill facility mission for duration of facility life or mission.
B Limited maintenance on basis of planned remaining useful life. Eliminate fire, health, and safety hazards. Patch and reinforce instead of replacing wherever economical. Consider breakdown maintenance.
C Limited maintenance to assure weather tightness, structural stability, protection from fire or erosion, elimination of safety or health hazards, and to permit reactivation within the period prescribed under mobilization plans.
D Eliminate fire, safety and health hazards. Prevent pilferage or loss of items affecting final disposal action. See para. 1.3.4.

Upon completion of all work, the checkoff sheet is turned over to the inspection team for final inspection. If everything is satisfactory, the inspectors will secure all exterior doors and windows, leaving all interior windows and doors open. All keys are placed in a marked container which will remain inside the building at the main entrance door. Secure the main entrance door by a hasp and padlock with a "SECURED" sign posted adjacent to it. Keys for the padlock shall be kept by the caretaker staff and the fire department.

1.4.4 Public Works Center (PWC). Those activities that receive service from a PWC instead of a PWD will have to rely on the PWC for inactivation/ closure support. Depending on local circumstances, the PWC may also be phasing down or completely closing. This will affect service provided by the PWC. In general, notify the PWC as early as possible what services are required so adequate planning can commence.

1.4.5 Officer in Charge of Construction (OICC)/Officer in Charge (OIC). Termination, modification, or award of public works contracts should be a part of any inactivation or closure process. If the Public Works Officer of the activity is "double-hatted" as the OICC/OIC, co-ordination between the activity Public Works organization and the NAVFAC contracts organization is relatively simple. However, geographic separation of the OIC/OICC compounds co-ordination efforts. In any case, earliest possible notification of contracting actions is essential. This will help ensure that the Government avoids a claim situation or continues to pay for contract services no longer required.

1.5 Economic Issues. In many cases, the decision to inactivate or close a facility or whole base may be more operationally or politically than economically driven. However, economics should play a part in the decision process.

1.5.1 Inactivation vs. Closure. The economic factors involved in the decision to inactivate or to close and dispose of a facility include:

a) Caretaker maintenance and operations cost of the inactivated facility;

b) Probability of future need;

c) Cost to excess or demolish the facility; and

d) Cost to construct a new facility, if ever required.

In general, if the facility has a very high value (and therefore extreme replacement cost), it may be worth keeping in an inactive status for potential future use. However, if the facility is of relatively low cost and

not particularly unique, it may not be worth the caretaker operation and maintenance costs required to maintain the facility in an inactive status.

In each case, the activity owning the facility should perform an economic analysis using NAVFAC P-442, Economic Analysis Handbook, to compare the cost of closure with the long-term cost of maintaining the facility in an inactive status. Factoring the cost and probability of future facility needs into this equation will help determine the time span over which to evaluate alternatives. If a requirement for use of a facility cannot be identified, closure process should be executed.

1.5.2 Expected Length of Inactivation. Probably the most critical and most difficult factor to predict in determining whether to inactivate or close and demolish/excess a facility is the length of time until it could be needed again. Extending the period of inactivation makes closure and demolition/ excessing more attractive, both economically and from a management standpoint. The nuisance of managing an inactive facility over a long period is avoided by demolishing or excessing the facility. The economic analysis described in para. 1.3.1 could determine a break-even point for inactivation duration.

1.5.3 Probable Future Use. Another consideration in determining what to do with unneeded facilities is the nature of the unneeded facility. If it is unique and can only support limited functions, its potential for future use can be far more limited than a general purpose facility that can be easily and cheaply modified to support many uses.

1.5.4 Maintaining Building Utility Service. Maintaining utility services, particularly heating, power, and air conditioning, is the most effective way to minimize deterioration of and damage to inactive facilities. However, utilities are expensive. In an unheated building in a cold climate, interior paint will peel, floor tile will pop up, and residual water in pipes will freeze. Heating the facility can preclude these problems. On the other hand, if the facility is inactive for many years, it may be more economical to repaint, replace floor tile, and repair piping upon reactivation, than to continuously heat the facility. A parallel situation exists with air conditioning and humidity control in warm climates. In all cases, the shore activity will have to compare costs to decide the right course of action to take.

1.6 Environmental Issues

1.6.1 Introduction. Inactivation or closure of a base may have a significant environmental impact. Before the decision is made to inactivate or close facilities, the provisions of the National Environmental Policy Act (NEPA) and Navy policy will have to be followed. OPNAVINST 5090.1, Environmental Protection and Natural Resources Manual, provides guidance on this process. In addition, EFD environmental expertise should be consulted since state and local regulations are variable and complex. The focus of this

handbook is on those general environmental actions that should be considered before the facility can be inactivated, the facility can be demolished, or real property can be turned over to GSA for further action.

1.6.2 General Areas of Concern. In general, the process of vacating facilities and inactivating them or preparing them for demolition will not cause significant environmental impact. However, those environmental problems or issues previously identified by the shore activity, particularly hazardous waste issues, should be resolved prior to demolition or transfer. The shore activity cannot just ignore sources of pollution or hazardous substances and transfer the cleanup to some other agency. The Navy is a large generator of hazardous wastes and, as a result, some Navy real property has been contaminated. If that property is later sold, the waste could jeopardize public health and result in a liability to the Government. In some cases, the problem may be so severe that closure and transfer to GSA is not possible without a significant expenditure of resources to mitigate or eliminate the problem. Asbestos is an item of concern, especially during demolition. In all cases, consult the EFD environmental branch for guidance and direction.

1.6.3 Hazardous Waste - Specific Areas of Concern. Over the last decade, the Congress has enacted major legislation concerning the management and cleanup of hazardous wastes. The Resource Conservation and Recovery Act (RCRA) of 1976 provides for regulatory controls over the generation, transportation, treatment, storage, and disposal of hazardous wastes.

RCRA regulates all aspects of hazardous wastes. Its responsibility lies mostly with the generator. Unless removed, underground storage tanks should be emptied, cleaned, and disconnected prior to closure. PCB transformers, switchgears, capacitors, and other PCB electrical equipment should be disposed of prior to closure or inactivation. All remaining oil-filled equipment should be tested, and records of results should be maintained. A facility closure may subject waste management facilities, process equipment, storage equipment, and wastewater treatment facilities to RCRA regulation. Development of a closure plan may be required. Approval of a closure plan may result in the need for additional permits or authorizations.

The Toxic Substances Control Act (TSCA) of 1976 restricts the manufacture, processing, distribution, and use of polychlorinated biphenyls (PCBs) . PCBs are toxic synthetic chemicals that are used for various purposes, such as fire resistance in electric transformers. PCBs have been associated with adverse health effects.

The Environmental Protection Agency (EPA), citing the Clean Air Act of 1970, classified asbestos as a hazardous air pollutant in 1978. To minimize the release of asbestos fibers into the atmosphere, EPA mandated work practices that are to be followed when demolishing or renovating buildings containing asbestos material.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as "Superfund," provides for the cleanup of hazardous waste sites by the party that owned or operated a site or generated or transported hazardous substances that contaminated a site. This liability does not terminate when the property is sold to another party. CERCLA was authorized in 1986 to require, among other things, that EPA promulgate regulations regarding federal property sales or transfers where hazardous substances may have been stored, released, or disposed of on the property. The Navy's version of the Superfund program is the Installation Restoration Program (IRP).

Normally, a shore activity in compliance with OPNAVINST 5090.1, has already identified and cataloged sources of hazardous waste and other potential sources of pollution. Asbestos surveys list those buildings containing asbestos. Underground tanks have been identified. PCB transformers have been inventoried. Disposal sites or dumps that may contain hazardous waste have been identified. Areas that may contain unexploded ordnance are cataloged. Petroleum, oil, and lubricant (POL) storage facilities are known. In these cases, the major concern is that records are maintained and not lost in the haste to shut down or inactivate an activity.

1.7 Security Issues. An activity requires security of inactivated or closed facilities awaiting demolition or excessing for multiple reasons. Keeping a facility secure and preventing unauthorized entry protects both the facility itself from damage and prevents injuries to people roaming around an inactive facility. This latter case is particularly true where inactive facilities are in plain view of on- or off-base personnel. Human curiosity will eventually win, and someone will try to gain entry into the facility just to see what is there. In the process of gaining entry, there can and probably will be damage to the intruder and the facility. While it is virtually impossible to keep a serious intruder out of a vacant facility, take action to keep out curiosity seekers. As a minimum, block or lock entrances, replace broken windows, and patrol the facility on a regular frequency. Facilities with entrance doors ajar and windows broken or left open invite unauthorized entry. Boarding will help eliminate broken windows.

For buildings away from the main base or installation (satellite or outlying facilities), additional precautions may be necessary. If the building is a considerable distance from the base, a roving patrol may not be feasible, and the building could be vulnerable to break-ins. An alarm system on doors and windows may be economically feasible if building contents are valuable.

Some facilities are not easily secured and may require considerable investment to prevent unauthorized entry. These facilities may be the type to demolish rather than retain in an inactive status.

1.8 Safety Issues. Safety is tied directly to security. If no one enters the vacant facility, no one can be injured in the facility. If the facility is not secured, the activity should be more concerned with safety. Refer to para. 1.7 for additional security issues.

1.9 Fire Prevention Issues. A key to fire prevention in inactivated facilities is to limit the highly combustible material and ignition sources remaining in the facility to only those items required during the inactivation or closure period. Remove any gasoline or other flammable material from tanks in and around inactivated facilities. Mow grass and weeds periodically within 25 ft. of the structure. As an alternative, plow fire lanes around the facility. This may be more economical than frequent mowing. Taking adequate security measures minimizes fires resulting from unauthorized entry and activity in the building. More detailed information on inactivation of fire protection and alarm systems can be found in para. 2.1.13.

1.10 Community Relations Issues. Inactivation or closure of a whole base or even portions of a base can have a significant impact on surrounding communities. An unfriendly environment magnifies the disruption and turmoil of the inactivation/closure process substantially. If the local government and press are hostile, the whole process becomes more difficult. Information is key toward maintaining good relationships with the local community. It is far better to provide as much information as possible on inactivation/closure milestones and their potential impact than to try to hide the imminent phase-down . Open clear lines of communication to continually pass information to the local community will help eliminate rumors and the problems caused by “misinformation." Regular tours and briefings of local community leaders and the local press are essential to keep hostility to a minimum.

1.11 Summary of Navy Real Property Disposal Procedures. The EFD Real Estate Division is responsible for the acquisition, management, and disposal of Navy real property. Basic guidance for these real estate actions is contained in the NAVFAC P-732, Real Estate Procedures Manual. The P-73 prescribes policies, authorities operating procedures, and responsibilities for the disposal of real and related personal property under the custody and control of the Department of the Navy.

Real property disposal procedures are often complex and subject to changing guidelines, policies, authorities, and procedures. Therefore, it is imperative that the EFD Real Estate Division be consulted before taking any action to dispose of or continue to utilize excess Navy real and related personal property. Under no circumstances should the activity initiate actions with the GSA concerning disposal of its real property.

1.11.1 GSA Responsibility. The GSA is responsible for ensuring that Federal real property is utilized and disposed of in the most economical,

efficient, and effective manner. GSA derives its authority to dispose of real and related personal property from the Federal Property and Administrative Services Act of 1949, 63 Stat. 377, as amended.

1.11.2 Department of Defense Responsibility. The Department of Defense has been delegated limited authority to directly dispose of real and related personal property as cited in the Federal Property Management Regulations (FPMR), Subpart 101-47.6. The FPMR contains specific guidelines for the disposal of all Federal real and related personal property.

1.11.3 Applicable FPMR Guidelines. Applicable FPMR guidelines have been incorporated into NAVFAC's P-73. When Navy real property and associated real property is identified as "not utilized," it may be classified as "excess" to the needs of the Department of the Navy. Under normal procedures, after the EFD Real Estate Division has reported the property to GSA for disposal, GSA screens the property to determine if there is an alternative federal use for the property.

1.11.4 Other Federal Agencies. If another federal agency has an approved and funded requirement for the property, custody and accountability for the property may be transferred to the agency, subject to reimbursement to GSA of 100 percent of the property's fair market value. Property reported excess to the needs of federal agencies is classified as "surplus" and is disposed of by GSA . Responsibility for protection and maintenance of excess real property remains with the reporting agency for a minimum period of 12 months pending its disposal by GSA.

Navy property reported as excess to GSA is not removed from Navy plant accounts until disposal by GSA has been completed. Completed guidelines are contained in the FPMR and the P-73. The FPMR established certain requirements concerning excess real property which (in its present condition) is dangerous or hazardous to the environment or presents health and safety hazards. The Navy should provide information on the extent of contamination, plans for decontamination, and the extent to which the property may be used without further decontamination.

If the property is contaminated as a result of Navy use, the Navy is responsible for funding and supervising its decontamination. The EFD should be consulted concerning the need for preparation of environmental assessments and other studies related to disposal of excess real property.

Section 2: INACTIVATION/REACTIVATION

2.1 Scope. The sections that follow provide information on inactivation/reactivation of various types of facilities and equipment. Appendix B provides checklists for use in this process. In addition, manufacturer's recommendations and literature should be consulted to provide complete guidance on a particular piece of equipment.

2.2 Buildings

2.2.1 Building Envelope Inactivation

2.2.1.1 General. Measures to be taken to put a building into inactive status include:

a) Repair and replacement of damaged or missing building shell components and roof repairs essential for weather-proofing.

b) Attention to ventilation requirements.

c) Prevention of corrosion and freezing.

d) Identification and storage of equipment and accessories.

e) Securing of the building.

f) Deactivation of building utility systems.

g) Attention to humidity control requirements.

h) Placement of a sign reading "SECURED" on all inactivated buildings. This sign should indicate the date and provide an emergency contact number.

i) See para. 2.2.17 for special construction or Historic Register-listed buildings.

All surfaces of buildings and all other enclosed structures, including roofs, should be made tight to exclude rain, snow, dust, sand, animals, birds, and rodents. Minimum maintenance of painted surfaces, roofs, glazing, and similar work should be accomplished at the time the station is deactivated and then continued as necessary. Leave building numbers in place for identification purposes. Adequate ventilation should be provided for all closed areas and beneath all building floors where skirting has been installed. This is particularly important in warm climates to help prevent mildew.

2.2.1.2 Screens. Screens for windows and doors should either be retained in their respective openings and securely fastened or labeled, removed, and stored. The proper procedure should be determined by the value of the screens and the cost of removal and reinstallation. Normally, leaving screens in place will help prevent entry of birds and animals.

2.2.1.3 Removal of Debris. Scrap lumber, trash, and other debris should be removed from inside, around, and under buildings and other structures. Salvage material, such as tin cans and other metals, paper, and grease, should be hauled to the salvage yard or disposed of in accordance with current instructions. After removal of debris, clean all floors with a broom.

2.2.1.4 Interiors of Enclosed Structures. All floors should be made free of chemicals, other corrosive materials, and hazards to personnel or equipment. Mortar containing metallic-type waterproofing should be applied at points where moisture wells up through holes and cracks in concrete or similar floors, in walls, and at junctures of walls and floors. Holes, cracks, and soft or porous places should be cut back to solid surfaces to provide a key for the waterproofing materials. Seeping expansion joints should be sealed with a suitable mastic. Removable floors in showers should be checked, cleaned, and stacked on edge in their respective rooms.

2.2.1.5 Exterior Surfaces. Caulking compound conforming to Federal Specification (Fed. Spec.)-TT-C-598, Calking Compound, Oil and Resin Base Type (for Masonry and Other Structures), should be used to fill caulking failures and shrinkage cracks around door frames, window frames, and other joints in wood and masonry structures. Joints *in* masonry that have dried out, loosened, or crumbled should be chipped out and repointed with mortor. Nails, screws, and bolts should be replaced if they have corroded to the extent that moisture is admitted into the construction; decayed wood should also be replaced. All loose bolts, screws, brackets, and shackles at joints and at connecting units should be tightened.

2.2.1.6 Doors and Windows. Exterior doors should be repaired so that they exclude the elements and prevent unauthorized entry. Windows should be boarded up and receive the minimum repair necessary to make them weathertight. They should be boarded up in such a way that the building is not made airtight as this can lead to mildew/mold problems. Parts such as hinges, locks, bolts, and catches should be coated with a corrosion preventive compound. Lock mechanisms should be lubricated with graphite. Doors should be locked, and their keys should be suitably tagged for identification. Secured doors should be labeled as to where the keys are kept in custody.

2.2.1.7 Roofing, Flashing, and Sheet Metal Work. Damaged or uncovered areas on surfaced built-up roofing should be repaired by patching or coating with a suitable bituminous compound and recovering with additional surfacing material. Areas on unsurfaced built-up roofing and prepared roofing should be repaired with saturated felt lapped 6 inches on all sides, embedded in, and

surfaced with a suitable bituminous compound. Corroded spots on metal roofing should be cleaned with a scraper until free of all paint and then sprayed or brushed with a suitable asphalt compound. Corroded or loose flashing should be replaced with new flashing of similar material, and all joints should be made weatherproof. Joints only slightly open as a result of drying and contraction may be sealed by gun-caulking with a suitable waterproofing compound. Roof drains, gutters, leaders, and all other outside sheet metal work should have corroded spots cleaned and treated as indicated for metal roofing.

2.2.2 Building Envelope Reactivation. Determining which buildings to reactivate will depend upon an evaluation of functional and structural requirements for reactivation based on available assets. Upon completion of this evaluation, a facility that is found suitable should be thoroughly inspected for a final determination of specific maintenance, repair, and cleaning requirements.

The facility must meet applicable codes and regulations or offer the possibility to be brought up to code within a reasonable cost. Items that may have been permitted at the time the building was initially constructed may no longer be allowed. Newer, more restrictive codes may now have to be met. Areas of particular concern are:

a) Life safety codes (number and type of exits, sprinklers, occupancy requirements).

b) Sanitation requirements (number and type of fixtures, materials for floors and walls).

c) Electrical requirements (wiring may have to be brought to current standard).

Local codes may be more restrictive than national codes and may contain provisions that could involve major reconstruction. A thorough evaluation must be made to ensure code compliance and to estimate the costs of returning the facility to use versus new construction.

2.2.3 Building Mechanical Systems Inactivation

2.2.3.1 Compressors. Air and gas compressors should be prepared for preservation when the main engine is prepared. Compressors lubricated from the crankcase of the main engine should be lubricated with preservative oil at the time the preservative oil is applied to the main engine. Clutches that are to be stored completely assembled must be locked in the disengaged position to eliminate contact between lining and pressure plate.

When air and gas compressors have *a* separate crankcase from the main engine, the crankcase should be drained and filled to the proper level

with preservative oil. The compressor should be run for five minutes, and while it is operating, preservative oil should be sprayed into the intake with the air cleaner removed until the oil coming from the unloader shows no sign of emulsification. After compressors have been treated, they should be tagged and dated.

Treat compressors to inhibit corrosion. The water jackets in the engine block and in the radiator should be flushed out with a mixture consisting of 60 percent antifreeze and 40 percent water. The water jackets should then be drained, and openings not otherwise closed should be plugged with suitable wood plugs and sealed with tape. Hydraulic couplings should be refilled with oil. If a compressor is to stand idle for a long period, remove the piston rod packing to avoid corrosion and pitting of the rods.

2.2.3.2 Engines

a) Diesel Engines. Diesel engines should be run for at least 5 minutes, at a speed of not more than 15 percent above the normal operating speed, under no load. Lubricating oil should then be drained, and a yellow tag should be attached either to the crankcase oil filler cap or in a conspicuous place on a radial engine. This tag should read:

"CAUTION: This engine was treated for storage on (date) . When the engine is placed in service, refill lubricating oil sump with _____ . "

Fuel lines and injectors should be drained and filled with flushing oil. The exterior surfaces of the engines should be cleaned of dirt and grease. All openings in engines and accessories, including breathers, air intakes, exhausts, exhaust expansion joints, and openings in starters and generators, must be closed with plastic sheeting or waterproof paper and taped. After all unprotected exterior surfaces of engines are dry, all taped surfaces and all engine accessories, except electrical wiring and accessories, should be sprayed with a preservative compound.

b) Gasoline Engines. Gasoline engines should be run on unleaded, undyed gasoline for at least 10 minutes beyond the time required to run out the leaded gasoline in the lines and carburetor. Interior surfaces of engines should be treated with crankcase preservative oil as follows: remove spark plugs; while the engine is rotating, spray sufficient oil through spark plug holes for adequate protection to cylinder walls, valve heads and stems, and valve guides using an air-atomizing type of spray gun. For L-head type engines, the oil may be poured in spark plug holes instead of spraying. Replace

all spark plugs, or seal the holes with suitable threaded metal plugs and gaskets. For valve-in head engines, valve covers should be removed, and the preservative oil sprayed over rocker mechanisms, interiors of valve covers, between cylinder blocks and side plates, over push rods, and into oil filler and crankcase ventilator pipes. The entire fuel system, including carburetor, fuel pump, strainer, and fuel lines, should be drained; and all parts should be dry. The lubricating oil system should be drained, and a yellow tag attached to the oil filler cap with the following information:

"CAUTION: This engine was treated for storage on (date) . When the engine is placed in service, refill oil sump with _____ "

Exterior surfaces should be cleaned; openings, sealed; and surfaces, sprayed with preservative compound.

2.2.3.3 Pumps. Pumps should not be left in pits or other locations where they are subject to water damage. When there is danger of pits being flooded, pumps should be raised to floor level or removed to storage. Pumps withdrawn from service but not removed to storage should be thoroughly cleaned, flushed with fresh water, lubricated, and treated to inhibit corrosion. After pumps have been treated, they should be tagged and dated.

a) Centrifugal Pumps. The pump shaft should be covered with heavy grease. All openings should be capped or covered securely, and all petcocks left open.

b) Rotary Pumps. The procedure should be as indicated for centrifugal pumps. One additional requirement is that a small amount of heavy oil should be poured into the rotor inlet and the pump rotated by hand until the rotor and moving parts are thoroughly covered with oil.

c) Steam-Driven Pumps. Steam lines and water-packing lines should be drained, and all openings capped or blanked off. Packing nuts should be loosened. A small amount of oil should be poured into the steam chest, and the valves should be moved to ensure a coating of oil between the valves and seats and on the cylinders, rings, and pistons. Petcocks should be left open, but all other openings should be covered to exclude dust and foreign material. The cylinder head should be loosened on the water end to ensure that all water is eliminated. Cylinder walls and pistons of water pumps 'should be covered with a protective film of oil.

2.2.3.4 Plumbing. If the building is to be inactivated without heat or water service, the following applies. All plumbing fixtures and supply piping should be drained, including hot and cold water storage tanks, in buildings not required for use by maintenance personnel. Supply lines for gas, air, water, and other liquids should be closed at the curb valve. Moving parts of the master valves within buildings should be removed and greased. When the curb valve is not of the stop-and-waste type, water should be pumped from the line between the master valve and the curb valve. Water traps on gas and air lines should be drained. The hot and cold water service lines should be drained through valves located at the lowest point in the system. Storage-type water heaters should be drained. Reservoirs, standpipes, and tanks inside or outside buildings should be drained of all liquids unless they are kept in service for fire protection or other purposes. All traps located at plumbing fixtures and drains in the sanitary system should be drained of their respective water seals. Traps should be immediately refilled with antifreeze to the normal water seal height. Antifreeze types should be approved by NAVFAC Code 10. This will prevent freezing in temperatures below 40 degrees F and bacterial growth in higher temperatures. Built-in trap seals in plumbing fixtures should be drained or treated with antifreeze; other trap seals should be drained by removing the cleanout plugs.

All sources of air contamination in buildings, such as drainage sumps, cleanouts, traps, grease interceptors, and industrial waste separators, should be emptied and cleaned. Sanitary sewer lines should be plugged to prevent the entrance of sewer gas into unoccupied buildings through plumbing fixtures and drains. Care should be taken, however, to preclude stoppage of drain lines that serve the roof,. the floor, the area drains, and other connections that must be kept in service. Sewer lines that connect to manholes and do not carry storm water may be plugged in the manholes; a record should be kept of all plugged sewer lines.

2.2.4 Building Mechanical Systems Reactivation

2.2.4.1 General. When reactivating engines and compressors, give special attention to the warning tags left on equipment at deactivation, with specific attention to lubrication systems. Use oil conforming to Military Specification (MIL)-L-9000H, Lubricating Oil, Shipboard Internal Combustion Engine, High Output Diesel, Seasonal Grade. All engines, pumps, compressors, electrical switchgear, transformers, electric motors, heating systems, boilers, water-softening and filtering equipment, and controls will require inspection, testing, and restoration to normal operation. Installation of items placed in storage, lubrication, and replacement of deteriorated parts will also require attention.

2.2.4.2 Compressors. Compressors having a separate crankcase should have the preservative oil removed from the crankcase and replaced with the proper grade, viscosity, and quantity of operating lubricating oil. Tighten all bolts, nuts, and capscrews. Turn the compressor over by hand to ensure that

there is no binding or interference of working parts. Check the air cleaner on the suction line and the valves on discharge line between the compressor and the air receiver to make sure they are free and open. Test relief valves and automatic controls.

2.2.4.3 Engines

a) Diesel Engines. Remove storage oil from fuel lines and injectors by flushing them with diesel fuel. Remove all closures and seals on engine openings and accessories, including breathers, air intakes, exhaust expansion joints, and openings on starters and generators. Check to see that the lubricating oil in the oil sump is of the proper grade, viscosity, and quantity; and make certain that all accessories are properly lubricated.

b) Gasoline Engines. Release sealed openings on gasoline engines. Remove spark plugs and spray (atomized) 2 ounces of SAE 10 motor oil in each cylinder. With the ignition off, rotate the engine for several cycles, then replace the spark plugs. Check ignition wiring and other wiring to ensure that it is in place and in serviceable condition.

2.2.4.4 Pumps. Lubricate all parts in accordance with the manufacturer's recommendations or instructions attached to the pump. Pay particular attention to packing; replace it if it is deteriorated or dry. Disinfect pumps transmitting potable water.

a) Centrifugal and Rotary Pumps. Uncap or uncover openings on centrifugal and rotary pumps and close petcocks. Check rotating parts to determine if they turn freely; turn the pump by hand and listen for unusual noises. Repack the pump if the packing gland leaks excessively.

b) Steam-Driven Pumps. Uncap or release capped, blanked-off openings on steam-driven pumps, steam lines, and water lines. Tighten packing nuts. Remove covers over openings and tighten the cylinder head. Close petcocks.

2.2.4.5 Plumbing. Plumbing fixtures and piping systems, including hot and cold water storage tanks, should be flushed thoroughly and refilled. All potable water piping systems should be disinfected in accordance with NAVFACINST 11330.14, Safe Drinking Water at Navy Shore Activities. supply lines and traps for gas, air, water, and other liquids should be blown out or flushed and refilled. All valves, faucets, drains, and flushing equipment should be made operable. Moving parts of the master valves should be repaired, when necessary. Any antifreeze used to prevent the system from freezing or to inhibit bacteria growth should be drained and disposed of

properly in accordance with EPA regulations. All sources of air contamination in buildings, such as drainage sumps, cleanouts, traps, grease interceptors, and industrial waste separators, should be unstopped, cleaned, and prepared for service. Any repairs necessary should be made in accordance with NAVFAC MO-114, Building Maintenance, Plumbing, Heating, and Ventilating, Volumes 1-3.

2.2.5 Building Electrical Systems Inactivation

2.2.5.1 General. Electrical service will be required for guards, security forces, and maintenance personnel. An evaluation should be made to determine minimum essential power requirements; distribution service should then be tailored to only those requirements in order to minimize costs.

The size of the installation and quantity of electrical equipment installed need to be evaluated to determine whether to remove the equipment to storage or to disconnect, inspect, preserve, and store the equipment in place. If the installation is small- to medium-sized and has adequate warehouse space available, it may be more economical to inspect, remove, preserve, and store electrical equipment in a central warehouse. Considerations need to be given to the quantity of equipment, the cost to remove and centrally store, the availability of warehouse space, and the cost of labor costs.

a) Inspection and Test. While being preserved for storage, electrical equipment should be inspected and tested. A record of these inspections and tests should be kept to indicate the maintenance required to return the equipment to full service.

b) Miscellaneous Equipment. Test equipment, electronic equipment, instruments, and gauges should be removed, labeled as to their exact location, wrapped in water-absorbant paper or plastic, packed in wooden boxes with shock cushioning, and placed in dry storage. Time clocks and photoelectric switches or control devices should be removed, wrapped, and packed in wooden boxes with shock cushioning.

2.2.5.2 Lighting Systems. In buildings that are to be kept ready for operation, lamps should be left in place, and all switches should be left open. If exterior lighting is to be maintained, street and fence lighting should not be disturbed. In buildings that *are to* be completely shut down and that will contain no stored material, fuses should be removed from fuse boxes, breakers should be left open, and all main switches should be kept open. Lamps in these buildings should be removed and placed in stock, ready for use elsewhere. In large buildings *or* those containing a considerable amount of stored material, machinery, or other equipment requiring protective storage, a sufficient number of lamps to provide adequate illumination should be left *in* their sockets.

2.2.5.3 Electrical Equipment Withdrawn from Service. Electrical equipment withdrawn from service, but not removed to storage, should be protected to inhibit corrosion. Lightning arrestors should be left connected and in service. Service switches in empty buildings should be open, and the continuity and condition of neutral grounds at switches should be checked. Switches for electrical or mechanical equipment should be left in the "OFF" or open position. Fuses should be removed and placed inside the fuse boxes, which should be securely closed. All disconnected wires, corresponding connections, and switches should be labeled appropriately.

2.2.5.4 Shrouding. Equipment should be covered completely with plastic or waterproof paper. Covering should be secured in place by waterproof tape along the edges of the top and sides of the covering *or* by wire or other fasteners as long as it is waterproof at the top. The bottom of the shroud should not be sealed. If two or more sheets of shrouding are joined, joints need to be sealed so that they are as waterproof as the shrouding material itself. Shrouding material may be applied in a shingle-type covering with at least 24 inches overlap; sealing is not required as long as waterproof protection from above is maintained.

2.2.5.5 Motors, Generators, and Control Equipment. Motors in dry locations and those totally enclosed should be protected in plastic. All motors and generator sets on permanent mounts should be protected/preserved in place. Motors and generators in damp locations should be cleaned, covered, and removed to dry storage. Motors, generators, control panels, switch boxes, circuit breakers, fuses, and control devices should be protected from dirt, dust, water, and mechanical damage by being covered with shrouds. Prior to shrouding, equipment should be cleaned, lubricated, and securely blocked and braced to prevent movement. Lubrication procedures that apply to the specific equipment should be followed in preparing material for inactivation.

a) Commutators. When accessible, lift the brushes and apply wax-free, Grade A, grease-proof paper around the commutator; then let the brushes rest against paper wrapping commutator. Rust-preventive compound should not be applied to the commutator.

b) Exposed Steel Shafts. Exposed steel shafts of motors and generators should be cleaned with solvent and coated with corrosion-preventive compound. Care should be taken to keep corrosion-preventive compound out of bearings, commutators, brushes, brush holders, collector rings, windings, and similar parts.

c) Bearings and Journals. Grease- or oil-lubricated journals, bearings, or similar surfaces should be lubricated as recommended by the manufacturer. Journal boxes and bearings should be wrapped in plastic or waterproof paper for protection from dust and dirt.

2.2.5.6 Batteries. When possible, lead acid batteries should be stored in a charged condition using a float charge. If it is not possible to float charge the batteries, the electrolyte should be drained, and the battery should be placed in dry storage. Nickel-alkali batteries should be fully discharged and placed in storage without draining off the electrolyte. When batteries are stored, leads should be disconnected and taped. Terminals need to be protected with corrosion-preventive compound.

2.2.6 Building Electrical System Reactivation

2.2.6.1 General. Remove all shrouding, protective wrappings, and coatings. Clean all corroded fittings and contacts. Verify electrical conditions by appropriate tests (dielectric or insulation resistance). Make necessary connections to restore equipment and systems to normal operating conditions. Use the inactivation and storage test and inspection data as a baseline for proper operation. Replace fuses, reset breakers, and re-energize the system only after careful examination to ensure that there is no potential shock hazard from bare wires or removed panel covers.

2.2.6.2 Lighting Systems. Inspect all parts of lighting system and insert new or undamaged lamps of the proper size and voltage in empty sockets. Clean lighting fixtures and repair or replace them as necessary. Recommended light intensities and procedures for cleaning fixtures are shown in NAVFAC MO-116, Facilities Engineering, Electrical Interior Facilities. Insert fuses of the proper size in fuse-type switches and panel boards. Check all switches for proper operation.

2.2.6.3 Motors, Generators, Controls, and Other Electrical Equipment. Clean, inspect, and test all such equipment. Repair or replace faulty parts. Clean control equipment by blowing it out with moisture-free, compressed air (not to exceed 50 psi). Remove time, clocks, relays, photoelectric cells, instruments, electronic tubes, and other devices from storage; check, repair if necessary, and reinstall them. Remove shrouding on equipment and grease-proof wrapping around commutators, release blocked motors and generators, and lubricate them in accordance with manufacturer’s instructions. Motors, generators, and transformers unused for extended periods of time may have to be dried out. Drying out should be accomplished only by experienced personnel using approved methods. Check insulation resistance with an ohmmeter. Resistance should be a minimum of 1 megohm and not less than 1 megohm for each 1,000 volts of operating power.

2.2.7 Heating, Ventilating and Air Conditioning (HVAC) Systems Inactivation

2.2.7.1 General. Careful attention should be given to completely drying and draining all equipment and to maintaining a protective film on all surfaces that might be attacked by moisture. Close all openings having to do with HVAC systems to prevent entry of weather, insects, animals, or birds.

All loose parts and accessories should be secured to the equipment from which they were removed to facilitate reactivation. Boiler, furnace, and air conditioning rooms should be left clean and orderly.

Minimum heat may need to be maintained when it is necessary to protect valuable machinery, buildings, structure and equipment, interior fire hose outlets, and working personnel from extreme cold. Minimum air conditioning may be necessary in extremely hot and humid climates to provide the same facility, equipment and personnel protection. In the event that heat or air conditioning is required, fuel and power sources should be maintained. Heat should not be discontinued until all plumbing fixtures and piping have been drained and treated with antifreeze. See para. 2.2.3.4.

Provide protection for air conditioning systems withdrawn from service but not removed to storage. Machined and other surfaces and bearings should be painted and treated with rust-preventive coatings. Painted interior and exterior surfaces of casings, structural supports, drain pans of unit coolers and evaporative condensers, and all other parts of equipment that show signs of corrosion should be primed and painted. Remove fan wheels and shafts before painting; distribute evenly paint sprayed on fan wheels casings and housings should be dismantled sufficiently to allow proper cleaning and painting, then reassembled. Exercise semi-annually HVAC controls, rotating equipment, valves, dampers, etc., to prevent corrosion freeze-up.

To prevent contact with paint, bearing surfaces and journals should be protected with plastic or tape. Fan motors, belts, pumps, usable-pads, and filters should be removed, cleaned, wrapped, and packed in suitable cartons. Tension on all belts should be loosened or relieved. All outside exhaust and intake openings and louvers should be closed, as well as air supply grills and ducts to buildings. Fans should be blocked to prevent rotation.

2.2.7.2 Heating Equipment and Piping. Heating equipment and piping withdrawn from service, but not removed, should be protected to inhibit corrosion, as indicated in para. 2.2.7.3. Boilers, pressure parts, auxiliary equipment, and all connecting lines should be drained, mud and scale accumulations washed out, and equipment and lines dried with compressed air. Connecting lines should be capped or sealed to ensure that boilers remain absolutely dry; all water remaining in drums or headers should be sponged out. Clean-out and drain plugs on cast-iron boilers and water heaters should be removed, and the opening left open and covered with screen to allow full circulation of air; plugs and caps should be attached with cord or wire near their respective openings. Boilers need desiccant or a nitrogen blanket for watersides in dry lay-up. Refer to the manufacturer’s instruction on this subject.

All supply and return lines should be drained of all water or condensate. If necessary, lines and heaters should be drilled and tapped at low points to ensure that all water is eliminated. All openings, once drained

and dried, should be capped tightly. Circulating tubes that are too flat to drain completely should be blown out with compressed air. Further moisture should be dried by circulating air or heat from a portable heater through the furnace.

2.2.7.3 Corrosion Prevention. After cleaning, surfaces should be painted, touched up if already painted, or treated with oil or an anti-rust compound.

a) The fire sides of tubes, shells, and fire boxes, as well as accessible surfaces of drums and tubes, should be painted or treated to inhibit rust. Bearings and journal boxes should be treated as indicated in para. 2.2.5.5.c. Gears in internal gear cases that do not run in grease should be coated with the type of oil normally used for lubrication. Used grease should be removed from grease-packed gear cases, and the cases refilled with clear grease of the proper type.

b) Unpainted, machined surfaces should be coated with corrosion-preventive compounds. Threads and finished surfaces on steel pipe left exposed when disconnected should be protected with afilm of graphite and oil. Interior and exterior painted surfaces that show signs of corrosion should be retouched with paint. Sheet metal that is not galvanized should be painted.

2.2.7.4 Space Heaters and Warm-Air Furnaces. Coal, ashes, soot, and carbon should be removed from combustion chambers, grates, and ashpits of space heaters and warm-air furnaces. Firing equipment, such as shakers and lid-lifters, should be placed in the firebox, and the firebox door closed and secured. Ash boxes should be thoroughly cleaned, the ashpan replaced, and the ash door closed and secured. Smokepipes should be taken down, and soot and carbon removed. All openings should be closed; if vent pipes cannot be removed, they should be tightly capped. Draft controls in stacks should be blocked in a closed position. Exposed metal parts should be protected with a coating of stove blacking. Humidifiers should be drained thoroughly; waterlines should be shut off and drained. If necessary, doors should be blanked, and all ventilation openings should be covered.

2.2.7.5 Air Conditioning Equipment. The refrigerant should be removed from air conditioning equipment and put into storage cylinders appropriately marked with the type of refrigerant and the date. Suitable warning labels should then be posted on switches and controls of equipment to indicate that refrigerant has been removed. If the oil in crankcases of compressors appears to be dirty or contaminated, crankcases should be drained, flushed, and refilled to the proper level with oil of the proper type. All equipment, including waterlines, cylinder jackets, condensers, pumps, and water pans, should be flushed with fresh water and drained, leaving all vents and drains open. Openings should be covered with screens.

Cooler and condenser coils should be sprayed with a commercial grade liquid cleaner or detergent, flushed with water, and dried with compressed air. Outdoor cooling towers and evaporative condensers, including piping, should be flushed, drained, and adequately protected with paint or other corrosion preventive coating; piping should be disconnected at equipment.

Coils and traps should be valved off and drained. Humidifying systems should be shut off and flushed, cleaned, and drained. Humidifying pads or filtering elements not suitable for further use should be discarded; usable pads and filters should be removed, cleaned, wrapped, and packed in suitable containers. Pneumatic control systems, including compression equipment, should be drained of water deposits and blown dry with compressed air.

2.2.7.6 Mechanical Ventilating Systems. Surfaces of equipment and bearings should be protected to inhibit corrosion. Blower shafts should be greased with heavy cup grease, and all bearings should be oiled. Driving pulleys and fan belts should be removed and fastened to driven pulleys.

2.2.8 Heating, Ventilating and Air Conditioning (HVAC) Systems Reactivation

2.2.8.1 General. Inspect heating and air conditioning systems and test them for proper operation. Remove all sealing devices from ducts and filters; check for blockage caused by any accumulation of dust and dirt. Check all electrical and plumbing connections. Remove shrouding and preservation material and compounds and ready equipment for return to service. All piping should be checked for leaks and repaired as necessary.

2.2.8.2 Air Conditioning Systems. Replace stored refrigerant or add new refrigerant in all refrigeration equipment. Remove all closures on outside exhaust and intake openings and louvers, on air supply grills, and on ducts to buildings. Release blocked fans. Replace all fan motors, belts, pumps, usable pads, and filters that have been stored. Inspect and adjust belts. Suitable filtering or softening material should be replaced in filters and in water-softening equipment in accordance with the manufacturer’s recommendations. Stored, usable humidifying pads or filtering elements should be cleaned and installed.

2.2.8.3 Mechanical Ventilating Systems. Remove heavy grease from blower shafts and lubricate all bearings. Check all driving pulleys for proper operation and adjust drive belt tension.

2.2.8.4 Automatic Control Equipment and Meters. Meters and instruments removed from their mountings should be re-installed on automatic control equipment. Pipe connections from controls to heating equipment should be reconnected, flushed, and filled. All containers for water, ink, or acid on

carbon dioxide meters and similar instruments should be refilled. Stored glass containers should be installed. Thermostats should be checked. Check valves, pressure regulators, etc. , should be inspected to make sure they are operable. When boilers are fired, combustion safeguards should be inspected and tested to ensure proper sequence and operation of the programming controls.

2.2.8.5 Heating Equipment and Piping. All equipment and piping should first be checked for leaks or corrosion and repaired if necessary. All clean-out and drain plugs should be placed back, and any screens removed. Lines to boilers should be uncapped. Allow water to circulate through the system to flush out any debris. Check all controls before firing the system up.

2.2.8.6 Space Heaters and Warm-Air Furnaces. Firing equipment, smokepipes, and any other pieces removed during inactivation should be cleaned and reinstalled. Waterlines to humidifiers should be re-opened, and all ventilation openings should be uncovered. The draft control in the stack should be checked for proper operation. The unit should then be fired and tested.

2.2.9 Refrigeration Equipment Inactivation

2.2.9.1 Iceplant and Brine Systems. The refrigerant should be removed from the equipment and stored in cylinders appropriately marked with the type of refrigerant, date and equipment. Brine tanks, water tanks, piping systems, strainers, and traps should be thoroughly flushed with fresh water and drained. Blowers, agitators, crane equipment, can fillers, ice-dump equipment, exposed surfaces of brine coolers and cooling coils, and all unprotected metal surfaces should be protected with paint. Ice cans should be cleaned, repainted as required, and stored in a dry place.

2.2.9.2 Refrigerated Spaces. Interior surfaces of cold storage rooms and refrigerators should be cleaned. Movable shelving, floor gratings, and dunnage should be removed, cleaned, and dried; meat hooks should be removed, cleaned, and packed in suitable cartons. These parts should be stored in cold storage rooms or refrigerators. Meat tracks, scales, door hinges, and miscellaneous hardware should be cleaned and coated with a light film of preservative. Door gaskets should be cleaned with doors fastened in a partially open or open position. To ease the weight on the hinges, blocks should be placed under doors. Exterior openings should be covered to exclude the weather.

2.2.10 Refrigeration Equipment Reactivation

2.2.10.1 Refrigeration Equipment. The refrigeration equipment should first be checked for leaks and repaired. The system can then be refilled with the stored refrigerant or with new refrigerant when necessary. Check the oil in the crankcases of compressors. If it is dirty or contaminated, the crankcases

should be flushed and refilled to the proper level with oil of the proper type; dry crankcases should be similarly filled. Check for leaks in receivers and refrigerant piping and repair them as required. All equipment, including water lines, cylinder jackets, condensers, pumps, and water pans, should be flushed with fresh water and refilled. Cooler and condenser coils should be brushed with a wire brush and cleaned with compressed air; air-cooled condensers that are heavily filmed with grease should be cleaned. Outdoor cooling towers and evaporative condensers, including piping, should be flushed, refilled, and reactivated. Disconnected piping should be reconnected to equipment.

2.2.10.2 Refrigerated Spaces. Clean the interior surfaces of cold storage rooms and refrigerators and repair them as necessary. All shelving, floor gratings, dunnage, and meat hooks that have been stored should be cleaned and installed. Meat tracks should be cleaned, as well as scales, door hinges, door gaskets, and miscellaneous hardware. Remove covers on exterior openings.

2.2.11 Water-Softening and Filtering Equipment Inactivation. The zeolite, for water softening, should be stored in an airtight container, in a regenerated wet condition. Steel tanks and pressure-type softeners and filters should be drained by opening the lowest drain connection or drain plug and by removing the top manhole, handhole, or plug. Except where there is danger of damage from freezing, the wood-gravity type should not be drained and allowed to become dry. All waterlines to softeners and filters should be disconnected and capped or blanked off. The exterior surfaces of steel tanks, piping, and valves should be cleaned and painted. The inside of steel tanks above zeolite or other types of beds should be scraped, cleaned, and painted with asphalt varnish. On zeolite tanks, manhole covers and plugs should be removed to permit passage of air through the tanks; to prevent loss, covers and plugs should be securely fastened to the tanks or piping. Brine and salt tanks should be emptied, scraped, washed clean, and painted inside and outside with the asphalt varnish. Multiport valves should be greased internally in accordance with the manufacturer’s instruction. Hydraulic valve lines and brine pumps should be drained and cleaned. Salt from brine or salt tanks should be stored in a clean, dry place.

2.2.12 Water-Softening and Filtering Equipment Reactivation. Al 1 disconnected water lines to softeners and filters should be connected; capped or blanked-off ends should be released. When corroded, the inside of steel tanks above zeolite or other types of beds should be scraped, cleaned, and painted with asphalt varnish in accordance with Fed. Spec. TT-V-51F, Varnish: Asphalt. Stored zeolite manhole covers and plugs should be installed on the storage tanks. Remove preservatives that prevent proper operation of the system. Disinfect equipment transmitting or processing potable water in accordance with NAVFACINST 11330.14.

2.2.13 Fire Protection and Alarm Systems Inactivation

2.2.13.1 Fire Extinguishers. At least two ordinary pump tank fire extinguishers should be winterized and placed at the exterior of main entrances to the building or in groups within reasonable distances of smaller buildings. These extinguishers require periodic inspection at the same frequencies required for active buildings.

2.2.13.2 Automatic Sprinklers. Dry-pipe sprinkler systems should be kept in service at all times, and deluge valves and other motivating elements should be kept well above freezing temperatures, in heated locations, or in dry-pipe valve cabinets. Wet-pipe systems should also be kept in service at all times, if economic studies determine that during periods of potential freezing temperatures, the structures should be kept heated to at least 40 degrees F to aid in preserving the building and equipment. In all cases, wet systems should remain active during warm and temperate seasons. This requires proper drainage and protection against freezing during cold seasons or periods. Electric strip heaters may be provided for valve enclosures, pits, pumprooms, etc. where electric service is available. Exceptional conditions may require conversion of wet-pipe to dry-pipe operation. If water tanks are used as the primary or reserve supply for fire protection or hydrant systems, suitable heating facilities for maintaining the water above 40 degrees F should be provided.

2.2.13.3 Alarm Systems. Automatic fire alarm systems should be kept in service; in some instances, minor changes may be necessary in the provisions for receiving alarms from such systems. Manual alarm systems of both the combination watch-and-fire alarm and the single fire alarm type should also be kept in service. No changes should be made in the fire alarm box circuits or box locations when reasonable security and supervision are provided.

2.2.13.4 Fire Reporting Telephones. Keep systems in service to meet fire alarm transmission requirements. When the administrative switchboard of a station is disconnected and when the fire-reporting telephone lines terminate in this switchboard, these lines should be re-terminated in the firehouse designated for that purpose. Consider providing an extension for communication to the administrative building. Also, consider combining fire- and guard-reporting telephones into one system, provided that both systems have compatible circuit features and are supervised electronically.

2.2.14 Fire Protection and Alarm Systems Reactivation

2.2.14.1 Fire Extinguishers. All fire extinguishers in use should be inspected, tested, recharged/refilled, or replaced if necessary. Additional extinguishers of the appropriate type for the location prescribed should be provided when necessary. See MIL-HDBK-1008A, Fire Protection for Facilities Engineering, Design, and Construction, for further details.

2.2.14.2 Automatic Sprinklers. Sprinkler systems, including dry-pipe valves, alarm valves, deluge valves, and trimmings, should be inspected and thoroughly tested in-accordance with NAVFAC MO-117, Maintenance of Fire Protection Systems, prior to being placed back in commission. Dry-pipe and deluge valves should be given the "trip" test. Air compressors for the dry-pipe-systems should be tested and placed in good operating condition. Perform a hydrostatic pressure test on wet- and dry-pipe systems. Repair and replace missing or defective valves, sprinkler heads, water flow alarms, and other operating parts of the system. Automatic systems that were converted from wet- to dry-pipe systems to protect them from freezing during inactivation should, when appropriate, be converted back to wet-pipe systems when reactivated.

2.2.14.3 Alarm Systems. Automatic and manual fire alarm systems should be inspected and tested by the EFD fire protection engineer. Make changes, repairs, and replacements, as recommended by him, to provide a fully operable, adequate, and reliable system.

2.2.15 Weight Handling Equipment Inactivation

2.1.15.1 Elevators and Hoists. Elevators and hoists should be cleaned and thoroughly lubricated. All unpainted surfaces subject to corrosion should be protected with a corrosion-preventive compound. Cars should be left at the bottom of the hoistways. To relieve tension on cables, counterweights should be blocked up or removed and lowered to the bottom of the hoistways. Cars or counterweights should not be allowed to rest on buffers. All hoist equipment should be lubricated, and load line clips and guides should be inspected for wear and damage. Replace them if necessary. For hydraulic equipment, replace broken fittings, change the oil and filter, and lubricate the generator, starter, and distributor shaft, if applicable, using the manufacturer's reference charts. Inspect and replace hydraulic oil and hydraulic pump belts.

2.2.15.2 Cranes. All bearings, couplings, reducers, and limit-switch gear cases on cranes should be filled with the required lubricants. Rollers, roller path, kingpins, collector-ring assemblies, boom-hinge pins, metal surfaces of friction clutches, brakes, bearing surfaces, moving contacts, and all other unpainted parts subject to corrosion should be coated with corrosion-preventive compound. All sheaves, pins, blocks, cables, drum grooves, and miscellaneous hardware should be greased. The heavy grease in bull gears should be retained. The fluid should be left intact in all hydraulic systems, except when danger of damage from freezing exists. Booms should be lowered to rest firmly on blocks on the ground or floor. Steam cranes should have all water drained and all holes plugged to prevent the entrance of moisture and dust. All liquids should be drained from diesel and gasoline engines, and the engines sealed against damage from dust or moisture as indicated in para. 2.2.3.2. Openings in cabs and machinery houses of cranes outside of buildings should be made weathertight.

2.2.16 Weight-Handling Equipment Reactivation

2.2.16.1 Elevators and Hoists. Counterweights that were removed or blocked up should be returned to the original state. Check all cables for proper tension. Lubricate all components in accordance with the manufacturer literature. In addition, inspect all safety equipment, such as fire extinguishers, limit stops, and safety hooks. Recertification of an elevator may be required if the certificate has expired. The EFD will assist in this process.

2.2.16.2 Cranes. All fluid and lubricant levels should be checked and filled to the manufacturer's required levels. If the hydraulic fluid was removed, replace it to the proper level. The rollers, roller path, kingpin, collector ring assembly, boon-hinge pin, metal surfaces, moving contacts, and any other parts that were coated during inactivation should be cleaned and greased. Steam cranes should be filled with water, if necessary. Cranes should then be tested using the applicable codes.

2.2.17 Special Construction or Historic Register. Buildings listed, or eligible to be listed, on the Historic Register or those of a special or unique construction require additional attention to inactivate. MO-913 , Historic Structures Preservation Manual, provides additional information regarding the proper treatment of these buildings. For buildings of special construction, be sure the unique facility features are incorporated into the activity inactivation efforts and maintenance plan.

2.3 Structures

2.3.1 Tanks, Towers, and Platforms Inactivation

2.3.1.1 Water Storage Tanks. Tanks should be maintained and kept filled with water. Leaks and damage to piping, hydrants, valves, and appurtenances should be repaired. When hazards to personnel exist, surplus ground level and underground tanks should be isolated from the water system and filled with sand or earth.

2.3.1.2 Petroleum Facilities

a) General. When gasoline or oil remains in storage, the system must be maintained in operational condition. Except when ballasting rubber-lined tanks, bulk quantities of gasoline should not be left in inactive tanks, since gum will form. The status should be plainly marked on each tank. All possible sources of explosion should be removed. Follow the procedures of MO-230, Maintenance and Operation of Petroleum Fuel Facilities, when entering tanks or performing maintenance on tanks.

Another point to consider when inactivating petroleum storage tanks is the use of cathodic protection. For tanks so equipped, the cathodic protection system should be inspected for proper operation and repaired if necessary. For tanks not equipped with cathodic protection systems, the activity may investigate the economic trade-offs of installing those systems at inactivation versus the associated caretaker maintenance costs and various environmental protection concerns.

b) Storage Tanks. Tanks should be emptied and cleaned internally in accordance with the applicable requirements of MO-230. If organic growth within the tank is a problem, a copper sulphite solution (1 part copper sulphite to 3 million parts water) may be used to provide water ballast and to discourage organic growth. A warning sign should be placed on the tank to indicate what it contains and whether it has contained leaded gasoline or other poisonous liquids or gases.

(1) Above-Ground Tanks. With the exception of fuel oil tanks, the unpainted interior surfaces of steel tanks should be coated after cleaning with preservative lubricating oil, and the interiors of fuel oil tanks should be treated with corrosion-preventive compound. Vents on lubricating oil tanks should be closed; vents on other tanks should be open. Tanks subject to high winds should be partially filled with water to prevent overturning except when there is the possibility of water freezing and rupturing the tanks. Liquid kerosene may be used for ballast if freezing temperature is a problem. Fuel oil tanks should be ballasted with fuel oil. Warning signs should clearly indicate the flammable contents.

(2) Underground Metal Tanks. Underground metal tanks, including water-displacement gasoline storage tanks, should be emptied, made gas-free, and cleaned properly. Tanks insufficiently anchored against flotation should be partially filled with water to prevent buoyancy. Where the danger of the water freezing exists, adequate safeguards should be provided. When a tank is to be abandoned in place, water should be removed, and the tank filled with sand. Other tanks should be cleaned, filled with oil, and marked as indicated for tanks aboveground in para. 2.3.l.2.b.l. Vent lines on underground tanks should be left open and be adequately screened; all other openings in tanks should be tightly capped or plugged after removal of equipment.

(3) Underground Concrete Tanks. Underground concrete tanks should be drained, made gas-free, and cleaned as indicated in paras. 2.3.l.2.a and 2.3.l.2.b. A minimum of 12 inches of unleaded gasoline should be kept in rubber-lined tanks. Safeguards against freezing should be taken.

(4) Fueling Pits. Inspect, tag, and cover fueling pits. Provision should be made for pumping pits dry.

(5) Hoses. Hoses should be removed, tagged and dated, and stored in dry storage.

c) Pipelines. Pipelines should be drained and capped or closed off with blank flanges. Unpainted and unwrapped lines exposed to the weather should be coated externally with corrosion-preventive compound. Preservation of pipelines for gasoline and oil should be effected by displacing the oil or gasoline with treated water as the cleaning agent, and then by displacing the water with dry air diluted with an inert gas to prevent explosion.

(1) Gasoline Piping. Before work involving heat is authorized on gasoline pipelines and before they are removed for any purpose, the lines should be freed of gas by using steam and by flushing with water. All pipes should be clean and free of gasoline odors.

(2) Fuel and Diesel Oil Piping. Excessive amounts of sediment and sludge should be removed from fuel and diesel oil piping by the use of scrapers or by the repeated circulation of a suitable sludge-emulsifying agent. If the use of the circulated sludge remover involves the temporary use of storage tanks lined with synthetic materials, an investigation should be made prior to the introduction of sludge remover to ensure that it will have no damaging effects on tank linings. All cleaning compounds should be thoroughly drained from the lines, and internal pipe surfaces should be protected from corrosion by flushing with fuel oil of the heaviest grade commensurate with the pumping and heating facilities available. Diesel oil lines should be tagged to indicate that they have been flushed with fuel oil.

2.3.1.3 Tank and Pipeline Appurtenances. Strainers should be removed, thoroughly cleaned, coated inside and outside with light oil, and reinstalled. Gaskets should be tight to keep out dirt and water.

a) Tank Level Controls. Controls such as float control valves, float-operated gauges, low level cutoffs, water detector locks, and probes should be removed from tanks. They should then be cleaned, treated with corrosion-preventive compound, and stored in a dry place.

b) Valves. Water control solenoid and pressure-reducing valves should be removed, cleaned, greased, and stored in a dry place. Other valves, such as plug valves and check valves, should be painted on the outside or treated with a corrosion-preventive compound and left in place. Plug valves should be thoroughly lubricated and left in an open position.

c) Meters. Meters should be removed, cleaned, treated with corrosion-preventive compound, and stored in a dry place.

2.3.1.4 Towers and Platforms. At inactivation, towers and platforms should be inspected for structural integrity and corrosion. Any defects that could threaten the ability of the structure to survive the inactive period should be repaired. Fencing should be repaired in accordance with para. 2.4.1.2. Pay special attention to any fencing required to ensure the security and safety of the structure.

2.3.1.5 Pools. Pool water should first be dechlorinated. The pool should then be drained, cleaned, and if possible, covered to prevent the accumulation of dirt and trash. Mechanical and other pool equipment should be withdrawn from service and preserved against deterioration in accordance with the instructions for similar equipment. Be sure that the security fencing and gates around the pool are repaired, as necessary (see para. 2.4.1.2). The gates should be locked to prevent unauthorized entry to the pool area and possible injury.

2.3.2 Tanks, Towers, and Platforms Reactivation

2.3.2.1 Water Storage Tanks. It should be determined whether the existing water supply and treatment systems are adequate for demand. Once it is determined that the water supply system is adequate, all parts of the system that were inactive should be disinfected and flushed according to the provisions of NAVFACINST 11330.14 prior to reactivation. Tanks should be inspected and repaired as necessary.

2.3.2.2 Petroleum Facilities

a) General. Inspect the systems and make wholly operable prior to refilling receptacles. This includes cleaning, making visual and measurement inspections, and reestablishing permits and licenses. MO-230 gives detailed, step-by-step procedures for cleaning and inspection of fuel facilities.

b) Storage Tanks. Areas of concern should be the structural integrity of the tank top, bottom, shell, and structural parts as well as the cleanliness of the inside of the tank. Entrance into the tank for cleaning or testing purposes should not take place until the tank has been certified gas free, unless proper clothing and breathing apparatus are used.

(1) Above-Ground Tanks. Remove any tank ballast prior to cleaning and testing the tank structure. Remove all corrosion-preventive compound from tank surfaces to inspect for corrosion; then re-coat non-fuel-contact surfaces. Open vents and check their operation and the condition of the screens.

(2) Underground Metal Tanks. Check vent screens and operation. Uncap openings; empty and clean tanks as necessary following standard safety procedures. Replace equipment, following normal maintenance checks, as appropriate, for the storage conditions in which they were kept.

(3) Underground Concrete Tanks. Remove any ballast from rubber-lined tanks and check the liner for holes or deterioration. Clean and inspect tanks for spalling concrete or gaping cracks. Pay particular attention to roofs and wall sections above the frost line, where the concrete is exposed to freeze-thaw cycles.

(4) Fueling Pits. Clean and inspect pits, and clear storm drain lines prior to returning the pit to service. Check drain line valves and operation of any associated oil/ water separators.

(5) Hoses. Check hoses for dry rot and reusability. In some states, hoses are inspected as part of the fuel system and are certified. Review hose condition criteria with your EPA and licensing officials. Age of hoses alone may prohibit their reuse.

c) Pipelines. Using as-built drawings, trace through each pipeline to remove caps, plugs, and blank flanges; and reinstall valves and vents. Remove corrosion preventive-compound and fully service valves to include proper exercise. Check all gasketed connections for dry rot. Check for corrosion on all blank flange connections that will remain in place. Flush the line and apply the appropriate pressure tests to ensure system integrity. Reinstall all pieces of ancillary

equipment. Repaint and relabel warning signs throughout the system. Have the appropriate EPA officials certify the system ready for use.

2.3.2.3 Tank and Pipeline Appurtenances. Remove, clean, and recoat strainers with light oil (make sure gaskets are tight) prior to recharging the system.

a) Reinstall tank level controls and check their operation. Check to make sure that tank level alarms work properly.

b) Clean and reinstall water control solenoids and pressure-reducing valves. Examine valves left in place for corrosion or cracks and repair them as required. Clean and close plug valves that were left open. Identify and retag each valve, checking the existing piping network diagrams.

c) Reinstall all meters and check them for proper operation.

2.3.2.4 Towers and Platforms. Only allow climbers trained for antenna rigging, tower maintenance, and climbing electricians to access elevated platforms and towers. Inspections should be thorough and include guy cable inspection, guy cable tension, foundation condition, anchorage condition, and structural inspections. Also, tower profiles should be checked against engineered criteria. Particular attention should be paid to bolted joints and welded stiffeners. Galvanized towers are sometimes painted for aviation visibility. Look for blistering paint that signifies loose paint covering corrosion. For special guidance, contact NAVFAC Code 04BC, the antenna systems consultant.

Check electrical systems, including conduits, junction boxes, antenna cabling, and obstruction lights, prior to energizing and reusing.

In areas where a high radio frequency might dictate, ensure the proper clearances are maintained at the base of the tower using appropriate non-conductive fence material and effective grounding design.

2.3.2.5 Pools. The pool should be uncovered and cleaned prior to being reactivated. Painting may also be necessary. Pool equipment should then be reactivated, the pool filled, and the water chemically treated.

2.3.3 Waterfront Facilities Inactivation

2.3.3.1 General. Specific inactivation procedures of waterfront facilities such as piers, wharfs, and graving drydocks vary from structure to structure. The following sections discuss general points that apply to most of these waterfront structures.

a) Electrical. Paint cable insulation and seal cables, as specified by the manufacturer's instructions. Turn off all circuit breakers. Remove all temporary disconnect switches, controllers, and panel boards. Repair circuit breaker enclosures. Reinstall gaskets and covers. Repaint any worn areas on all corrodible metal surfaces. Touch up any galvanized surfaces have been worn or damaged. Wood service hood enclosures and timbers should be treated with preservative. Treat insulator mounts, nongalvanized and nonpainted steel, and metal nameplates with rust-preventive compound.

b) Mechanical. All existing rust should be removed from exposed pipes and valves by sandblasting. The exposed pipes should then be steam-cleaned and repainted in accordance with Military Standard (MIL-STD)-101B, Color Code for Pipelines and for Compressed Gas Cylinders, if at a service hood, or treated with a preservative compound. Install plastic caps on threaded ends of fresh water and salt water outlets. Ensure existing cathodic protection systems are operating properly; repair them if necessary.

2.3.3.2 Graving Docks. Inactivation procedures for graving drydocks vary according to the anticipated time of inactivity, mobilization requirements, economic considerations, climatic conditions, etc. However, before these specific procedures can be identified, the method of drydock storage should be determined, i.e., dewatered or flooded, caisson in place or removed. Each alternative presents different caretaker maintenance and reactivation problems that should be considered prior to inactivation. For example, if the drydock is stored in a flooded state with the caisson removed, dirt and silt can accumulate in the dock basin; whereas with the caisson in place, the trapped water can stagnate and should be chemically treated. Once the method of inactivation is decided, the specific inactivation procedures can be identified.

a) Dock Basin. If the drydock is to remain dewatered during inactivation, it should be thoroughly inspected for leaks through the floor, through the walls, and around the seals of the end closure. Drainage, flooding, and discharge culverts and tunnels should also be inspected. All leaks discovered should be repaired. Leaks in docks that are to remain flooded should be identified but need not be repaired unless they pose a threat to the structural integrity of the drydock. All other concrete surfaces should be inspected while the dock is dewatered for spans, cracks, and other defects that could worsen during the inactive period. Any major, or potentially major, structural defects identified should be repaired.

b) Sluices. Stop logs should be placed at all discharge outlets. Flooding sluice gates should remain closed, and stop log gates should be placed in the screen guides. The following items should be cleaned of marine growth, fouling, and corrosion and coated with anti-corrosive compound, bituminous primer and enamel, or standard ships' bottom coating, if available:

(1) Trash racks.

(2) Sluice gates, guides, and stop logs.

(3) Dock floor gratings and culvert air vents.

(4) Collector channel screens and gratings and sluice gates.

(5) Dewatering sumps (clean only, coating unnecessary).

(6) Backwash trash rack and hinged stop gate.

c) Ship Blocking. Leave all bilge and keel blocking in place unless the dock will be used for berthing or placement elsewhere is called for. Loose timber should be removed.

d) End Closures. All end closures and seats should be inspected. If the caisson is to be left in place, damaged closures and seats should be repaired before inactivating the dock. End closures and seats should be left in such condition that they will be usable if the dock is reactivated. In docks that are to be left in the flooded condition, it is normally desirable to remove the caisson gate and maintain it afloat. A caisson in poor condition, when determined practical by an engineering analysis, may be sold or scrapped. For those drydocks that have flap gates for end closures, contact NAVFAC EFD for guidance.

Caisson-type closures that have not been drydocked and overhauled within a 12-month period prior to inactivation should be drydocked, repaired, and preserved, unless they are to be disposed of as discussed in this section. Exterior surfaces of end closures should be given protective coatings and cathodic protection as recommended by NAVFAC EFD. All interior surfaces should have protective coatings, and some spaces may be dehumidified (See para. 2.3.3.2.e, below).

e) Machinery and Equipment. Machinery spaces housing the main dewatering pumps and valve motors should be kept in a dehumidified state. If this is not possible, all electrical gear, pump motors, and control equipment should be shrouded in

plastic, per para. 2.2.5.4. Remove and store all instruments not necessary to maintain water levels in accordance with the instructions of para. 2.2.5.1.b. Protect machine-finished steel surfaces, such as on capstans, winches, and pump assemblies, with a coat of preservative oil or compound as directed by the EFD. See para. 2.2.3.3 for further details on pump inactivation. Paint the exteriors of any remaining operating equipment with one coat each of machinery filler and light gray machine enamel. Paint exposed surfaces of piping and conduit as required to prevent corrosion damage.

f) Electrical. Electricity should be maintained to power any dehumidification equipment in use, standby pumping, minimum lighting essential for inspection, other required operations, and fire protection systems.

If the drydock remains dewatered during inactivation, power to operate two of the drainage pumps at each main drainage sump will be required. That part of the electric utility system not essential for power requirements should be disconnected at the nearest load center. All energized electric circuits are to be tested for grounds and continuity.

All other nonessential electrical equipment should be preserved for inactivation in accordance with the instructions of para. 2.2.5.

g) Utilities. All utilities except those essential for minimal inspection, operation/maintenance, and fire protection requirements in the drydock area should be inactivated. All facilities that provide electricity, potable and salt water, sewerage, communication, drainage, gas, compressed air, steam, oxygen, and acetylene services to the drydock facility and to shops serviced in the drydock during normal operations should be inactivated. Inactivated piping should be drained unless it is part of a loop system needed for distribution reliability. Spare parts for utility systems that are not required for the drydock during the inactive period should be either sold as surplus, preserved and stored, or discarded. Spare parts should be disposed of only if the equipment is still supported by the manufacturer.

h) Fire Protection. Fire protection systems, including communication and alarm equipment, may be inactivated except when an inactivated dock is to be used for berthing. Dry chemical extinguishers should be available in all spaces where electric circuits are energized.

i) Miscellaneous Work. The entire area in and around the drydock should be cleaned and left shipshape. Exposed metal surfaces of screens, gratings, gates, racks, cleats, bollards) ring-eye bolts, stairways, ladders, manholes, hatches, capstans, and other metal appurtenances for the drydock should be cleaned and protected against corrosion during inactivation in accordance with instruction from the EFD. Wood fenders, chafing strips, and stop log gate closures should be given heavy applications of an appropriate mixture of coal tar and creosote in accordance with NAVFAC MO-312, Wood Protection. Supplies and portable ship repair equipment should be removed and disposed of or overhauled, tagged, and preserved at a designated storage area. Retain fuel and lubricants only in quantities needed for testing and maintenance during the first year of inactivation.

2.3.4 Waterfront Facilities Reactivation

2.3.4.1 General. Inspections should be made of all docks, wharfs, bulkheads and other waterfront structures to determine the amount of rehabilitation required. Instructions for inspection and condition evaluation are contained in NAVFAC MO-104, Maintenance of Waterfront Facilities, and MO-322. Additional information and assistance can be obtained by contacting the cognizant EFD.

2.3.4.2 Graving Drydocks. Drydocking facilities should be inspected, repaired, and certified for safety in accordance with NAVSEAINST 11420.2, Drydocking Facilities; Safety Certification Criteria for Docking U.S. Navy Ships, and MIL-STD-1625C, Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for U.S. Navy Ships.

a) Initial Inspection. The first step in the reactivation process is to make a complete inspection of the drydock facilities. Include in the inspection a diving inspection of the submerged surfaces of the end closure. The results of this inspection, in conjunction with the reports of periodic caretaker maintenance and inactivation inspections, will form a baseline of the required reactivation actions.

b) Drydock End Closures. While in drydock, end closures should be completely dewatered. Paint and bituminous protective coatings should be checked and, where found to be deficient, should be touched up or repainted. Sea valves, gratings, manholes, and hatches should be made watertight. Recondition vents to ensure unrestricted air flow. When the end closures have been repaired and made seaworthy, they should be set in their outboard seats. Where necessary, replace gaskets in the outboard seats.

c) Removal of Dehumidification Equipment. Before entering drydock spaces dehumidified during inactivation, samples of the air and tests for oxygen and toxic gases should be made. Such spaces should be unsealed, and the caulking and taping should be removed. Vents and other openings that have been closed should be reopened. The dehumidification equipment, including the humidistats, should be disconnected and removed. Remove and scrap shrouds and envelopes on static dehumidification systems. Desiccants should be disposed of as required.

d) Utilities. All electric conduit and circuits should be checked for leaks, continuity, and ground. Any necessary repairs should be made. All disconnected or de-energized circuits should be returned to active status.

e) Fire Protection. Fully restore the fire protection system to active status and tested for proper operation. Complete any repairs necessary.

f) Dewatering Systems. Reactivate the dewatering system. The system should be checked out, and all necessary repairs should be made to verify its operability. Dewater drydocks flooded for inactivation.

g) Ship Blocking System. Check and make secure hold-down fastenings. Replace missing and defective hardware. Inspect the soft caps for splittings, checking, and other defects and, where necessary, replace with new caps. All of the caps should be brush and spray-creosoted.

h) Machinery and Equipment. Remove the corrosion-preventive compound applied prior to and during inactivation. Fuel lines containing the preventive compound may have to be flushed with fuel. Such flushing fuel should be disposed of properly.

Essential material offloaded or otherwise disposed of at inactivation should be replaced in kind or with more current material. This includes such equipment as staging, welding machines, sandblasting equipment, paint spraying equipment, chocks, cleats, capstans, etc. The required type and the quantity of material will be determined by the operating staff and will be related to the mission of the reactivated drydock. Draft gauges should be in place and repainted.

i) Miscellaneous Work. Upon completion of the described work, the entire reactivated drydock facility should be cleared of all debris. Necessary material should be stored in its proper place, and the entire area should be left in a workmanlike,

shipshape condition. Lifelines, handrails, stairways, and ladders should be securely in place.

j) Operating Test. When all of the reactivation actions have been completed, a complete operational test of the drydock facility should be conducted and monitored. The test will start with the drydock dewatered and will include flooding and removal of the end closure, positioning of one of the larger craft that the drydock can accommodate, replacement of the end closure, and dewatering of the facility. The cycle is to be conducted, where possible, by the drydock's normal operating personnel. It should be monitored jointly by responsible personnel representing management of the activity and NAVFACENGCOM. Corrections of major malfunctions and deficiencies will be made, and the tests will be repeated, if necessary, until the responsible personnel are satisfied that the drydock is operational.

2.3.5 Railroad Trackage Inactivation

2.3.5.1 Trackage. Ground level crane or railroad tracks required during the inactive period for dismantling, maintenance, or other essential services should be maintained in a safe condition for slow traffic (Class I Standards). Maintenance and repairs of other tracks, including rails, ties, ballast, and accessories, should be discontinued. Flangeways at crossings should be kept clean on all tracks remaining in service. Switch points should be locked or spiked in closed positions, and all switch lamps should be removed and stored. Movable parts of switch assemblies should be cleaned and covered with heavy oil.

2.3.5.2 Track Scales. Track scales should be disconnected to prevent damage to the mechanism when it is not in use. Track scales inactivated should be marked "SECURED" and dated. Scale pits should be drained and cleared of rubbish. All parts subject to corrosion and not otherwise protected should be treated with corrosion-resisting compound specified by NAVFAC EFD.

2.3.6 Railroad Trackage Reactivation

2.3.6.1 Trackage. All ground-level crane and railroad rail, roadbed, ballast, drainage, right-of-way, accessories, controls, and signs need to be repaired, realigned, regauged, and brought to grade as required for safe operation. Tighten all loose bolts, plates, nuts, spikes, and other fastenings. Inspect switches to be sure they are operable, and grease them. Replace rotten or questionable ties. Return stored accessories to service. Clean and replace contaminated ballast.

Trackage should be inspected according to FRA track safety standards and NAVFAC MO-103, Maintenance of Trackage. Trackage not meeting Class 1 standards should not be used. Trackage not meeting Class 2 standards should have restricted use. Operational restrictions should be approved by NAVFACENGCOM . Excessively worn or defective rails should be replaced in accordance with MO-103 standards. Weeds along the right-of-way should be destroyed or cut to reduce fire hazards. All warning signs, instruction boards, and signals should be reinstalled or restored to proper working condition. Crossings should be rehabilitated as necessary.

2.3.6.2 Track Scales. Track scales should be adjusted, repaired, and restored to operable condition. Scale pits should be drained and cleared of rubbish.

2.3.7 Bridge Inactivation. Bridge inactivation requires a detailed inspection of the structure. Any physical damage, defects, or corroded areas that threaten the ability of the bridge to survive the inactive period should be repaired. An economic study should be completed to determine whether to inactivate or close a damaged bridge. Footings should be examined for structural integrity. Mechanical equipment for drawbridges should be inactivated in accordance with the instructions for the particular equipment types. Related activities are discussed in paras. 2.4.1.3, and 2.4.1.4.

2.3.8 Bridge Reactivation. The structural integrity of the bridge should be verified before it is reactivated. Footings of the bridge should be examined for erosion. Any major structural or corrosion damage should be repaired. The load-carrying capacity of the bridge should be tested with assistance from the EFD, and load limit signs should be posted.

2.4 Grounds

2.4.1 Grounds Inactivation

2.4.1.1 General. Make arrangements to retain the minimum amount of maintenance equipment. Pending disposition of excess stock, proper storage should be provided to prevent damage from the elements. Keys to all doors, gates, hatches, and other moving items should be checked and labeled.

2.4.1.2 Fencing. Tighten connections at gates, posts, braces, guys, and anchorages to ensure stability and correct alignment. Hinges, latches, locking devices, and all other alignment hardware should be cleaned and lubricated. Confine painting to those parts of fences and gates that show signs of corrosion.

2.4.1.3 Drainage. All storm sewers, drainage ditches, and other drainage structures should be cleaned and repaired as necessary to prevent flooding and storm damage to roads, runways, tracks, and structures.

2.4.1.4 Paved Surfaces

a) Roads and Runways.

(1) Unpaved Shoulders. Unpaved shoulders should receive only the maintenance necessary to ensure positive drainage of surface water from the adjoining pavement. Holes and ruts should be filled, and ridges should be bladed to eliminate standing water. Backfill depressions when the undermining of pavement is threatened. When possible, existing ground cover should be retained.

(2) Concrete Pavements. Concrete pavements should be repaired only as required to perform service activities and to prevent severe disintegration. Bituminous surface patching of depressed or broken slabs should be accomplished to prevent pending of water and the resultant saturation of the subgrade. Joints and cracks in concrete pavement should be kept sealed by bituminous material.

(3) Bituminous Pavements. Surface repairs of bituminous pavements should be limited to the repair of holes, raveled areas, edge failures, and open cracks. Repair unused surfaces only as necessary to maintain drainage and to prevent the pending of surface water.

(4) Gravel and Stabilized Surfaces. Gravel and stabilized surfaces should be shaped and repaired to maintain crowns required for drainage.

b) Walks, Curbs, and Gutters. Protect the edges of raised sidewalks, curbs, and gutters from undermining by the use of riprap or sod.

2.4.2 Grounds Reactivation

2.4.2.1 General. Keep the restoration of grounds to a minimum to avoid disturbing nature in accordance with NAVFAC MO-100.1, National Resources Land Management. Eroded slopes, banks, and earth covers for magazines should be filled, reshaped, and vegetated. Replant bushes, trees, and grass areas as required to protect structures, roads, or runways from erosion; to control dust ; and to reduce silting in drainage ditches.

2.3.2.2 Fencing. Security fences should be restored to usable condition. Connections for gates, posts, braces, guys, and anchorages should be tightened. Gates should be straightened and made operable. Hinges, latches, locking devices, and all other hardware should be cleaned and lubricated for easy operation. Reactivate fence lighting and alarm systems as required.

Existing fences not required for security or restriction to trespassing should remain, if in good condition; unsightly and damaged fencing should be removed. Hold painting of fences to a minimum. New fences should be installed only when required for specific security reasons.

2.4.2.3 Insect and Rodent Control

a) On-site Survey. An on-site survey should be made to establish the need for, and the best means of, pest control. The survey should consist of an inspection and report by the EFD special assistant for applied biology and Natural Resources staff, which will establish guidance for maximum economy, effectiveness, efficiency, and safety in areas pertaining to:

(1) Entomology.

(2) Marine biology.

(3) Rodent control.

(4) Wood preservation.

(5) Weed control.

(6) Lawns, shrubs and trees.

(7) Food, fabric, and nuisance pests.

b) Control Plan. A pest control plan should be prepared to initiate control of disease vectors and pests at the earliest possible time. The plan should include operations for control of pests as determined by the inspection. Operational methods, supplies, equipment, and transportation need to be planned. The planning must be in sufficient detail for determination of the pest control chemicals and application methods to be selected.

2.4.2.4 Drainage. Storm sewers and drainage ditches should be cleaned and repaired, when necessary, to prevent damage to roads, runways, tracks, and structures. Storm sewers that are blocked should be chain-cleaned. Conditions causing the formation of pools or retarding flow in ditches should be corrected; banks should be kept smooth, and all debris, silt, mud, and other obstructions should be removed. Drainage structures such as culverts, inlets, and catchbasins should be cleaned and reshaped as necessary to provide full design capacities and efficiency to prevent flooding and storm damage.

2.4.2.5 Paved Surfaces

a) General. Roads, walks, pavements, runways, and similar features should be repaired, replaced, and resurfaced to restore them to serviceable condition. Paving, preservation, and stabilization of drainage should also be accomplished. Repair parking and storage areas as appropriate for the class of road pavement, and regrade where necessary to provide satisfactory drainage. Repair traffic aids, including guard fences, markings, and signs, or provide new ones, when necessary. The extent of weed removal from shoulders and rights-of-way should be limited to that necessary for proper drainage, fire prevention, and the control of noxious weed growth. Clean and repair drainage structures, including culverts, underdrains, storm sewers, inlets, and catchbasins; repair where necessary to prevent flooding and storm damage. Repair and reshape intercepting ditches, flumes, check dams, and road ditches to provide adequate flow capacity.

To check severe erosion and to prevent obstruction of drainage channels, backfill, reshape, and stabilize slope and shoulders as necessary.

b) Roads.

(1) Unpaved Shoulders. Repair or restore shoulders to ensure positive drainage of surface water from the adjoining pavement. Fill holes and ruts, and blade ridges to eliminate standing water. Restore existing ground cover.

(2) Concrete Pavements. Clean and fill cracks and joints in concrete pavements with an appropriate joint filler in accordance with NAVFAC MO-102, Maintenance and Repair of Surfaced Areas. Provide bituminous surface patching of depressed or broken slabs to prevent pending of water and resultant saturation of the subgrade, or to restore the serviceability of the pavement. Limit the renewal of expansion joints to the extent necessary to relieve serious spalling.

(3) Bituminous Pavements. Limit surface repairs on bituminous pavements to the repair of holes, reveled areas, edge failures, and open cracks. Use materials comparable to those in place. Seal-coat brittle but otherwise serviceable pavements.

(4) Gravel and Stabilized Surfaces. To maintain crowns necessary for drainage, reshape gravel and stabilized

surfaces, and repair with materials comparable to those in place. Correct conditions that may result in failures on essential roads. When dust constitutes a serious hazard or source of damage to property, provide dust palliative treatments.

c) Runways. Reactivation procedures for runways vary depending on the length of deactivation and the anticipated use. The activity should coordinate with the EFD, Code 04, to arrange for an airfield condition survey. The results will determine necessary steps for reactivation. An FAA recertification may also be required if the runway has been deactivated for over two years. The EFD coordinates all recertification efforts.

If the runway has only been deactivated for a short period and the FAA certification is still valid, reactivation measures as outlined in para. b) of this section should be taken. In addition, airfield pavements should be marked according to the latest criteria; all other marking should be obliterated.

d) Walks, Curbs, and Gutters. Repair paved walks, curbs, and gutters where necessary to place them in a condition suitable for normal safe use. Provide drainage along walks.

2.5 Utility Plants and Distribution Systems

2.5.1 Steam Inactivation

2.5.1.1 Boiler Plants. Boilers should be laid up in accordance with NAVFAC MO-324 Inspection and Certification of Boilers and Unfired Pressure Vessels. If possible, the gas distribution pressure should be lowered to the minimum in the active portions of systems, thus reducing leakage and conserving gas. In addition, an operating and maintenance manual should be prepared prior to shutdown, if one does not already exist.

a) Drums and Tubes. Manhole and handhole yokes, studs, and nuts of drums and tubes should be coated with paint, oil, or grease; when accessible, machined surfaces such as those on caps and seats should be coated in a similar manner. After the interior surfaces of the drum are cleaned and treated to inhibit corrosion, the manufacturer's instructions should be followed carefully in reassembling. If any gasketed joints have been broken, new gaskets should be installed.

b) Superheaters. For the balljoint type of superheaters, individual elements should be disconnected and washed out with hot water; water should then be blown out with compressed air. After the elements have dried, they should be plugged. When

possible, the interior of headers should be cleaned and rustproofed. Welded-joint type superheaters should be washed as a unit and dried by portable heating equipment. Ball ends and seats should be protected by a coat of grease and protective wrapping; element seats in headers should be greased and plugged; yokes, studs, and nuts should be greased.

c) Economizers. Economizers should be cleaned and dried, as indicated for welded-joint type superheaters. Handholes, ballpoints, and other parts should be treated to inhibit corrosion.

d) Air Heaters. Deposits on the gas side of air heaters should be removed carefully. Tubular and regenerative types should be cleaned thoroughly by lancing or by washing with an alkaline solution followed by clean water. Tubular heaters may require turbining or wire brushing. If excessive deposits on tubular and regenerative heaters will cause serious corrosion, the heating surfaces should be removed. Air heater inlets should be closed, if possible, to prevent circulation of air; dampers should be tightly closed. Tube ends of tubular air heaters should be plugged with wood plugs.

e) Fans, Ducts, and Dampers. Ball and roller bearings of fans, dampers, and damper-operating mechanism bearings, gears, and couplings should be greased. All deposits should be removed, and all exposed surfaces should be painted. Dampers should be closed to prevent air circulation. When necessary, wood barricades should be built into the ducts.

f) Valves. Bonnets should be removed from valves. Finished surfaces should be greased or otherwise treated to inhibit corrosion. Valves should be reassembled after treatment.

g) Water Columns and Gauges. Water columns and gauges not removed should be treated to inhibit corrosion; alarm-type water columns should be opened. Knife edges, valve parts, and other parts subject to corrosion should be coated with grease or another rust-preventive compound.

h) Soot Blowers. All soot should be removed from blowers. Valve parts, gears, and other contact surfaces should be greased.

i) Soot and Ash Hoppers. Soot and ash hoppers should be cleaned thoroughly and exposed surfaces painted. Discharge outlets should be sealed with dry building sand.

j) Piping, Structural Steel Framing, and Casings. Exposed metal surfaces on piping, structural steel framing, and casings should be primed and painted.

k) Settings and Insulation. The interior of settings should be cleaned, and doors should be painted. To keep the materials in settings and insulation dry, doors and all other openings should be sealed carefully, and pans of quicklime should be placed inside the setting.

1) Pulverizers, Feeders, and Exhausters. All bearing surfaces on pulverizers, feeders, and exhausters should be coated thoroughly with rust-preventive oil or grease. With the exception of unfinished surfaces of castings, all exposed metal surfaces should be primed and painted.

m) Coal Pipes and Burners. Coal pipes and burners should be blown out with compressed air. Bearings and other finished surfaces of burner dampers and vanes should be thoroughly greased.

n) Coal and Ash-Handling Equipment. Coal and ash-handling equipment should be cleaned, including weighing devices. Running parts should be protected with grease, and exposed metal surfaces should be primed and painted. Conveyor belts should not be left under tension.

2.5.1.2 Feed-Water Heaters, Deaerators, Vent Condensers, Water-Heating Equipment, Tanks, and Receivers. Feed-water heaters, deaerators, vent condensers, water-heating equipment, tanks, and receivers should be drained completely; take care to remove all water from trays, tubes, and coils. Silt, scale, and lime should be removed; wire brushing may be necessary to eliminate all corrosion blisters in tanks and receivers. Blowdown tanks should be drained. Clean flues of all deposits of soot and carbon; remove and store baffles. Heaters should be left open. All steam and water lines should be drained, and openings capped or blanked off. Tightly cap vent pipes. Overflow and oil traps should be thoroughly cleaned and reassembled. Manholes, handholes, and cleanout doors should be left uncovered; all covers, studs, bolts, nuts, and other loose parts should be coated with grease and securely fastened in place at their respective openings to protect against loss. The threads of tapped openings and machined surfaces, such as those on valves and flanges, should be greased. Gauge glasses and thermometers should be protected against breakage. The interiors of steel tanks, deaerators, vent condensers, and heaters should be coated with corrosion-resistant paint; if tanks may later be used for drinking water, the coating should be enamel conforming to Navy Civil Engineering Laboratory (NCEL) Publication TDS 77-09, Coating Interiors of Steel Potable Water Tanks, or applicable American Water Works Association (AWWA) specifications.

2.5. 1.3 Automatic Control Equipment and Meters. Automatic control equipment and meters left in place should be shrouded in accordance with para. 2.2.5.4. Where instruments are removed from mountings, all openings in connections on heating systems should be plugged, and the openings in the instruments should be sealed with the type of adhesive tape used in shrouding. Pipe connections from controls to heating equipment should be disconnected and drained thoroughly. Covers on all controls and instruments should be fastened securely in place to exclude dust and moisture. All containers for water, ink, or acid on carbon-dioxide meters and similar instruments should be drained completely, and all openings should be tightly closed to exclude dust. Glass containers should be wrapped carefully in cloth or paper and stored in the instrument case. All ink should be removed from pens or recording instruments, and pen arms should be lifted. Each instrument should be wrapped in paper, and manufacturer's recommendations should be followed. Motorized valves should be oiled in accordance with the manufacturer's directions. Thermostats should be set on the lowest settings.

2.5.1.4 Combustion Equipment. Combustion equipment, discussed in the following paragraphs, consists of stokers, oil burners, and gas burners.

a) Stokers. Stokers should be run until all coal has been removed from the worm and hopper. Oiled sawdust should then be run through the worm until all surfaces are covered with an oil film. Remove all coal, clinkers, and ashes from the tuyere grates, ashpit, and dead plates. Housings on gearboxes should be securely fastened in place; oil in gearboxes should be retained. Hoppers paint. Hoppers and heater pipes should be tightly closed either with wood or metal covers. Fan shafts should be greased, and fan and blower bearings should be thoroughly oiled. Stokers with hydraulic power to ram-type feeds should be left with oil in the pumps and piping for hydraulic power; all openings on reservoirs should be tightly closed. Pneumatic spreader-type stokers should have all blowers tightly closed. Securely fasten cover plates on air intakes should be in place.

b) Oil Burners. The firing ends of burners should be covered with shrouds. If a burner can be swung out from firing ports, the entire burner should be shrouded. All oil should be drained from pumps, valves, lines, and reservoirs into the oil tanks. All openings on oil tanks should be tightly closed; the vent should be turned down, and a wire screen fastened securely over vent openings.

c) Gas Burners. Gas should be shut off outside the buildings; lines should be bled slowly through the gas burners. Areas in which the gas distribution is to be discontinued should be cut off from the remainder of the system by the closing of valves.

All burners should be thoroughly cleaned. Primary air openings should be closed to exclude dust; louvers should be fastened in a closed position. When equipment is disconnected from the distribution system, the pipe openings should be capped or blanked off. Weights should be removed from regulator arms.

2.5.1.5 Miscellaneous Equipment. In general, all exposed machined surfaces not otherwise protected should be treated with rust-preventive compound or paint.

a) Unit Heaters. Steam and water unit heaters should have supply and return lines disconnected; heaters should be thoroughly drained. Oil and grease cups on fans and blowers should be filled. When the construction of unit heaters prevents the covering of motors, louvers should be tightly closed with waterproof paper or plastic and tape. On gas or oil-fired heaters, secure fuel lines outside the building line.

b) Pressure-Reducing Valves. Open and drain equalizing pipes between diaphragm chambers and low sides of systems, and thoroughly clean the interiors of valves. Remove plugs from drain holes, and leave drains open; loosen valves without drains loosened to permit drainage of moisture. Open vents and leave open on the low-pressure side of valves.

c) Strainers. Strainers should be drained and thoroughly cleaned; drain plugs should be left open to permit drainage of moisture.

d) Radiators and Connectors. Completely drain radiators and connectors, and tightly cap or cover all openings.

e) Steel Smoke Pipes and Stacks. Steel smoke pipes and stacks should be cleaned internally with a wire brush and coated with discarded engine crankcase oil or mineral oil of similar quality. Exterior surfaces not otherwise protected should be coated with rust-resisting paint. If possible, stacks not dismantled should have tops tightly closed off with metal caps or boards. When the tops of stacks cannot be closed off, stacks should be blanked off at boilers to prevent moisture from entering smoke boxes and tubes. When blanking the stacks from the inside of the smoke boxes, drains should be provided to the outside. When smoke pipes or stacks are removed, resultant openings in walls or roofs of buildings should be closed with either wood or metal covers.

2.5.1.6 Gauges, Instruments, and Miscellaneous Parts. Gauges, instruments, and miscellaneous parts should be removed from equipment and marked as to parent equipment. Water columns and gauges, with the exception of simple

tubular gauges, illuminators, and floor mirrors, should be removed, cleaned, and stored in a safe place; water legs of all gauges should be drained, and fragile parts of instruments and controls should be removed, wrapped, and labeled. Vents should be plugged or covered to exclude dust, according to the manufacturer's recommendations. Operating panels and control devices that cannot be stored should be protected from dirt and moisture by shrouding with plastic film. Testing equipment should be collected and stored where it may be easily located. Chemical solutions should be removed from portable flue-gas analyzers and discarded; all liquid should be drained from the water jacket around the measuring burette. If warm storage is not available, extra chemical refills should be transferred to the nearest active installation.

2.5.2 Steam Reactivation

2.5.2.1 General. Certified boiler inspectors should inspect boilers and pressure vessels internally and externally, as well as hydrostatically before they are fired. All deficiencies should be corrected. Thoroughly flush out boilers and other pressure parts, auxiliary equipment, and connecting lines with an alkali solution to remove all traces of oil; wash out completely all accumulations of mud and scale. Remove caps and blanks from connecting lines, reconnect all lines and piping; repair drilled or tapped drainage holes made during deactivation. Replace all clean-out and drain plugs. Painted surfaces of castings, structural supports, and similar parts of equipment that show signs of corrosion should be cleaned and retouched with a suitable paint. Sheet metal that is not zinc-coated should be painted.

2.5.2.2 Boiler Plants. Remove all desiccant bags, lime trays, wood blocking, tools, and other foreign objects before securing manhole and handhole plates. Clean gaskets; use new ones if necessary, and coat them with a suitable graphite paste to prevent sticking when they are to be removed.

a) Drums and Tubes. If gasketed joints on drums and tubes have been broken, new gaskets must be installed. All joints that have water or water and steam on one side and dry steam on the other should be absolutely tight. Check all drier screens to ensure they are spaced correctly.

b) Superheaters. For the ball-jointed type of superheater, individual elements should be reconnected. Remove grease and protective wrappings. The superheater safety valve should be set for a lower pressure than the boiler drum safety valves and checked for proper operation.

c) Air Heaters. Open air heater inlets and dampers.

d) Fans, Ducts, and Dampers. Clean and lubricate fan and damper bearings, gears, and couplings. Remove wood barricades placed in ducts, and open dampers and test systems for air delivery requirements.

e) Water Columns. Close alarm-type water columns and remove preservative coatings.

f) Soot and Ash Hoppers. Clean discharge outlets on soot and ash hoppers that were sealed with sand.

g) Settings. Release sealed doors and other openings and remove any containers of quicklime placed therein.

h) Safety Valves and Pressure Gauges. Safety valves and pressure gauges should be cleaned, calibrated, and reinstalled.

i) Coal and Ash-Handling Equipment. Adjust the tension on conveyor belts, check the belts for tears or other damage. Lubricate bearings in accordance with manufacturer's instructions.

2.5.2.3 Feedwater, Heaters, Deaerators, Water-Heating Equipment, Tanks, and Receivers. Feedwater heaters, deaerators, vent condensers, water heating equipment, tanks, and receivers should be flushed and refilled. Covers of manholes, handholes, and cleanout doors should be reinstalled. Remove coverings on gauges, glasses, and thermometers, check/calibrate and reinstall them. Disinfect equipment transmitting or processing potable water in accordance with NAVFACINST 11330.14.

2.5.2.4 Gas Burners. Clean and adjust all gas burners, open primary air openings, and adjust louvers. Open covers on meter indexes. If water is present in a meter, disconnect and drain it. Reinstall weights on regulator arms.

2.5.2.5 Miscellaneous Equipment. Refill all equipment that has been drained. Replace instruments and parts that were removed. Replace stored water columns and gauges, illuminators, and floor mirrors. Replace chemicals in portable flue-gas analyzers and liquids in water jackets around the measuring burette. Remove all closures or heading equipment and preservatives that would prevent proper operation of the equipment.

2.5.3 Electric Distribution Systems Inactivation

2.5.3.1 General. Electrical service needs to be maintained in those inactivated installations or sections of installations that require guards, security forces, or maintenance personnel. Only the minimum essential amount of power should be supplied to these areas. To accomplish this objective,

only those primary and secondary circuits required should be left energized. Reduce the number of energized transformers to a minimum by connecting adjacent secondaries together. Transformers may also be replaced by smaller, surplus transformers if they meet the distribution requirements. If transformers and associated switchgear are inactivated in place and not energized, additional measures should be taken against corrosion. Normally, electrical components are fairly dry by virtue of being above ambient operating temperatures. In order to prevent moisture condensation, these electrical system components should be carefully sealed. Heating the building will also aid in eliminating moisture buildup.

2.5.3.2 Utility Services. All contracts for utility services should be carefully reviewed to determine the minimum requirements for the changed status of the activity. Utility companies supplying services should be advised of the changed status of the station and of the anticipated reduction in demand, personnel, and use of equipment that might affect the rate of service. Modification or termination of utility contracts should be scheduled to coincide with a change of status of the activity. EFD 09B has the sole authority to amend or cancel utility contracts.

2.5.4 Electric Distribution Systems Reactivation

2.5.4.1 Utility Services. Utility requirements for the reestablished activity need to be determined. The utility company supplying services should be advised of the changed status of the activity, and the utility contract should be expanded or reestablished to provide the necessary level of service. This will be the responsibility of the EFD Code 09B.

2.5.4.2 Distribution Systems. If, during the inactivation of the facility, the number of energized transformers was reduced or transformers replaced by smaller ones with the secondary circuits connected accordingly, the distribution system must be restored or upgraded to meet the new utility requirements. This means disconnecting the smaller transformers; disconnecting the adjacent secondary transformers; and providing the number of primary and secondary circuits needed for normal operations. The smaller transformers should then be removed and stored or properly disposed of. After transformers have been checked to see if they are operable, the following steps should be taken:

a) Cables should be meggered and measured for polarization levels to detect moisture migration into species.

b) The system should be restored by replacing the primary fuses at substations, closing the primary and sectionalizing switches, and closing the cutout doors for the transformer primary cutouts.

c) Check lightning arresters and grounds, and measure the resistance of grounds. A maximum value of five to 10 ohms is permissible. Contact NAVFAC EFD for further information.

d) Test insulating oil in transformers, regulators, switches, circuit breakers, and other equipment; if unsatisfactory, filter such oil and test again. If still unsatisfactory, replace the oil. After the oil is removed, flush out and clean oil reservoirs, tanks, and unit cores.

e) Checked and tested live-line tools should be removed from storage and placed in an accessible location. All live-line tools showing deterioration should be tested and repaired prior to being placed in use.

2.5.5 Potable Water Inactivation

2.5.5.1 General. The potable water system of the installation is vital to the public health of base personnel as well as the adjacent civilian populace. Changes to the water system layout may require approval by local, state, federal, and applicable DOD regulatory agencies.

a) Environmental Engineering. Consult the EFD Environmental Branch in the technical planning stages of installation deactivation about the water and wastewater system operation, the layout, and the coordination with regulatory agencies involved.

b) Civilian Populations. Civilians, who draw upon a station's water system and are served by the station's wastewater system, should be informed when the station is to be placed in inactive status. Water supply in sufficient quantity and quality should be provided to serve the continuing requirements of the station's personnel and equipment, including fire protection, flushing, and irrigation. Adequate skilled operating personnel must be retained for water and wastewater facilities that are left in operation. Inactivated equipment should be tagged "SECURED" and dated.

c) Chlorine Cylinders. Other than those required for operation, chlorine cylinders should be returned to the point designated by base management.

2.5.5.2 Water System. If the water supply for the active station was chlorinated, chlorination should be continued during inactivation. Adequate chlorinator capacity should be made immediately available to maintain the required residual in case of fire or other heavy demand upon the water supply. Auxiliary treatment, for such purposes as removing iron or for softening the

water supply, should be continued unless otherwise directed by the EFD Environmental Branch. Algae control should be maintained in reservoirs and tanks in accordance with local and seasonal requirements. Clear wells and tanks should be kept filled. Wells that produce the least satisfactory water or that are more expensive to pump should be designated for standby service. Normal water pressure should be maintained throughout the entire distribution system. Leaks and damage to piping, hydrants, valves, and appurtenances should be repaired. Dead-end lines should be flushed regularly. All mainline valves should be tested at intervals. Exposed waterlines subject to freezing, as on piers, should be disconnected from the system and drained. In addition, the following steps should be taken:

a) Treatment plant capacities should be reduced to the degree practicable in order to conform to expected water requirements. Surplus tanks should be drained and cleaned, and outlets arranged so that water will not be retained. Provision should be made to prevent damage from uplift or freezing.

b) The number of filters and other water treatment units required for reduced flow conditions must be determined individually for each station; most satisfactory results may not always be obtained with intermittent operation of clarifiers. Filters can be operated at reduced operating rates in rotation for such periods as necessary to provide the amount of water required. In general, each filter should be operated for short periods at least every 3 days. Apply treatment to prevent organic growth to filters as necessary. If there are two or more filtration plants, one may be placed in an inactive condition, provided adequate fire protection service can be maintained with the remaining filter capacity. Inactivate filtering and water-softening equipment as indicated in para. 2.2.11.

c) A fire hydrant flow test should be made just prior to the freezing season. Fire hydrants should be tested for frost action after each period of prolonged cold weather. Hydrant barrels should be pumped out at the end of these tests.

2.5.6 Potable Water Reactivation

2.5.6.1 Inspection. Consult with the Environmental Branch at cognizant EFD's in the technical planning of facility reactivation for establishing water system adequacy, operating procedures, and coordination with regulatory agencies.

2.5.6.2 Facilities and Equipment. Equipment, piping, valves, and controls should be reactivated as specified for similar equipment. In particular, the distribution system should be chlorinated. Filtering and water-softening equipment for special uses, such as boiler plants and laundries, is included

under para. 2.2.8. Water supply in sufficient quantity and of a quality meeting current Safe Drinking Water Act (SDWA) standards should be provided. This service should meet the base's continuing needs based on the requirements of the station's personnel and equipment, plus that necessary for fire protection and for other purposes, such as flushing and irrigation. Restoration of normal flow-operating procedures as applied to clarifiers and filters must be determined separately for each station.

2.5.7 Sewage Inactivation

2.5.7.1 General. Approval for changes in the wastewater system layout or operation that will alter the degree of treatment or final disposal point must be obtained from appropriate regulatory agencies. Normally, this will require a modification or reissue of the discharge permit. In some cases, installation of septic tanks and leaching fields for servicing small contingents of guard or maintenance personnel may be more advantageous than operating the station treatment facility.

a) Continuance of Sewage Treatment. When sewage treatment is continued in the station facility, flow should be concentrated into the least number of units consistent with the maximum loadings permitted. Units removed from operation should be drained, cleaned, thoroughly oiled, and filled with clean water. Recirculation may be employed to eliminate excessive detention periods and resultant septic action. In the absence of recirculation facilities, surplus pumps and temporary lines should be utilized to effect recirculation. Treatment plant equipment should be operated normally, and the following procedures observed:

(1) Safeguard filter-dosing tanks against freezing by reducing dosing tank capacity or by concentrating the flow to one filter during cold weather.

(2) Drain siphons and exposed pipelines or otherwise protect against freezing.

(3) Lift station discharge pipe contents should be displaced at least once every 6 hours; it may be necessary to *use* fresh water to accomplish this, but cross-connections should be avoided.

(4) Float controls in wet wells should be adjusted to maintain sewage at a level that will ensure frequent pumping.

(5) Pumps, standby engines, and control apparatus should be inspected and operated at least once each week.

b) Discontinuance of Sewage Treatment. When the use of station sewage treatment facilities may be discontinued, the facilities should be tagged as secured and bypassed to prevent seepage water from passing through the plant.

(1) Screen pits and grit chambers should be drained and cleaned. Screens and comminutors should be cleaned thoroughly. Screenings should be disposed of in an approved manner.

(2) Sedimentation tanks should be drained and cleaned; if these tanks are *not* of the type drainable by gravity, they should be filled with clean water and kept oiled during warm weather to prevent mosquito breeding. Provision should be made to prevent damage from uplift or freezing.

(3) Trickling filters should be removed from service, and all piping should be drained to prevent freezing.

(4) Activated sludge and contact aeration-type plants should be treated as indicated for the sedimentation tanks, except that porous tubes and plates should be given special care.

(5) Sludge in sludge digesters should be retained for a minimum of five days after plant shutdown to reduce gas evolution; then the digesters should be opened for ventilation, and the sludge should be drained to drying beds. Care should be taken to prevent explosion of gas-air mixtures in the digesters. Personnel should not be allowed to enter digestion tanks while they are being drained or while the danger of asphyxiation or gas poisoning exists. After a tank has been drained, it should be cleaned and kept ventilated.

2.5.8 Sewage Reactivation

2.5.8.1 General. The Environmental Branch of the cognizant EFD should be consulted in the technical planning of installation reactivation. It is especially important that the branch be consulted in establishing wastewater/sewage treatment system adequacy, operating procedures, and coordination with regulatory agencies since treatment processes and regulatory criteria may have changed during the inactivation period. Additionally, the discharge permit will have to be modified or reissued.

2.5.8.2 Wastewater Systems. Determination should be made that existing wastewater treatment is adequate in accordance with the latest regulatory agency criteria. The sewage-treatment plant should be returned to operation.

Trickling filters, Imhoff tanks, settling tanks and beds, and digesters removed from service should be returned to service. All treatment equipment, piping, sanitary sewers, etc. should be cleaned, tested, and returned to service. Discontinue any existing arrangement whereby the sewage-treatment plant is being bypassed to prevent seepage water from passing through the plant.

2.5.8.3 Contracts. Water and sewage treatment may involve contracts with local utility agencies. The usage anticipated upon reactivation should be estimated, and contracts should be revised, as necessary.

Section 3: CARETAKER MAINTENANCE

3.1 General. As stated in para. 1.3.2, caretaker maintenance refers to the level of maintenance performed on an inactivated facility to preserve its weathertightness, security, and protection from fire, rodents, birds, or human damage. Caretaker maintenance also includes performing those tasks necessary to keep an inactivated facility aesthetically acceptable when it is located among other active facilities.

The process for maintaining an inactive facility is the same as for maintaining an active facility, only the degree and frequency of task execution may be different. All relevant Navy instructions and publications, such as NAVFAC MO-321, Facilities Management; MO-322; and OPNAVINST 11010.34B Instructions for Preparation and Submission of the Type "A" Annual Inspection Summary and Narrative Assessment, still apply. The cyclical sequence of inspection and maintenance procedures must still be followed. NAVFAC's philosophy of controlled maintenance still applies. This section relates the various maintenance and inspection procedures to caretaker efforts.

3.1.1 Types of Maintenance Actions

3.1.1.1 Preventive Maintenance. This category involves the day-to-day effort required to keep a facility, piece of equipment, or system functioning. The intent is *to* reduce downtime by anticipating problems and taking necessary actions to prevent them. Preventive maintenance actions are usually low cost, have little impact of activity resources, and are performed by operators, rather than maintenance personnel.

3.1.1.2 Corrective Maintenance. Corrective maintenance involves the planned replacement of material or components that have *worn* or failed, thereby causing a degradation of a system or facility to operate at full capacity. This category involves maintenance efforts that are more involved than preventive maintenance and are usually accomplished by maintenance technicians.

3.1.1.3 Breakdown Maintenance. Breakdown maintenance is necessary when an unplanned building or system failure occurs. It is the most costly type to perform because it cannot be routinely planned. Maintenance personnel must react to breakdown situations immediately, interrupting other planned work. Also, proper spare parts or other materials may not be readily available, causing a need to substitute less adequate material or cannibalize some other system.

3.1.1.4 Borrowing. In the normal maintenance of active facilities, there is a tendency to "borrow" parts or components from buildings or facilities in an inactive status. This "borrowing" or 'cannibalization" appears prudent at the time since it saves the time required to obtain the parts from normal channels. The intent is always to reorder and eventually replace the borrowed

part. Unfortunately, the replacement is rarely completed. This can leave the inactive building or facility in an extremely degraded condition. Additionally, when the facility is ready for activation, it may be difficult to identify what specific parts or components have been borrowed. Finally, needed parts may no longer be available. All of this can result in an excessive cost to repair a facility prior to reactivation. To preclude this problem, the maintenance management organization should establish policies and appropriate checks to ensure borrowing does not become commonplace.

3.1.2 Types of Facility Inspections. The following paragraphs provide brief descriptions of the key facility inspection actions. Further information on the Navy's shore facility inspection system can be found in NAVFAC MO-322.

3.1.2.1 Operator Inspection. Operator inspection generally refers to the routine examination, lubrication, and minor adjustment of equipment and systems to which a specific operator has been assigned. Additionally, it includes any effort by an operator to identify equipment or system problems that can be corrected through maintenance by either the operator or maintenance technicians. These inspection logs should be consulted prior to inactivation or closure to identify potential problems or changes to the system.

3.1.2.2 Preventive Maintenance Inspection. Preventive maintenance inspection is defined as routine examination, lubrication, and minor adjustment of equipment and systems not otherwise assigned to full-time operators.

3.1.2.3 Control Inspection. Control inspections are scheduled examinations or tests to determine the material condition of a facility, piece of equipment, or system. They are normally accomplished by activity caretaker personnel or contractors. The results of these inspections are the primary input to the Annual Inspection Summary (AIS) and are used to generate corrective maintenance job orders (see para. 3.2.3). OPNAVINST 11010.34B provides detailed guidance on preparing an AIS.

3.1.2.4 Specialized Inspection. A specialized inspection is a scheduled examination of systems of components that require specialized expertise or equipment to determine their condition. The specialized inspection program is administered by NAVFAC EFDs. Results of specialized inspections should be integrated with findings of the control inspection program in order to determine overall facility condition.

3.2 Caretaker Maintenance Planning

3.2.1 Maintenance Action Plan. In accordance with the Navy's Maintenance Management System, every Navy activity is required to develop a plan to accomplish its maintenance actions. This maintenance action plan should

address all the facilities, both active and inactive, present at the activity; specific equipment at the activity; and personnel who will plan, execute, and manage the actions. The plan should also list specific maintenance and inspection frequencies, areas to check, and any unique features of all the buildings, equipment, and systems. The mechanics of how the plans are developed and used depend on the physical plant and management philosophy of each individual activity.

Input to the maintenance action plan comes from the inspections carried out under the Maintenance Management System. These inspections (operator, preventive maintenance, control, and specialized), as defined in para. 3.1.2, identify facility, equipment, and system deficiencies throughout the activity's physical plant. In general, it is the preventive maintenance and control inspections that provide the most useful input to the maintenance planning efforts.

3.2.2 Inspection Frequency

3.2.2.1 Preventive Maintenance. It is the responsibility of the maintenance division, with assistance from the cognizant EFD, to determine what equipment to inspect and how often. This is usually done based on the recommendations of shop personnel, Navy publications, and manufacturer's documentation.

3.2.2.2 Control. Inspection frequencies are established based on experience and engineering judgment. Appendix A lists the suggested minimum control inspection frequencies, per NAVFAC MO-322. These inspection frequencies are standards for active facilities and equipment. Review for applicability to the specific details of the inactive/closed facility and tailor to establish a site-specific set of caretaker maintenance requirements. If systems and equipment are placed out of service and secured, inspections may not be required. Maintain systems like cathodic protection for underground utility distribution systems and tanks and sanitary and storm sewers as for active facilities. The cognizant EFD can provide guidance in developing a specific set of procedures that take into account activity specific conditions such as:

a) Facility categorization codes

b) Age of facility

c) Type of construction

d) Climatic conditions

e) Mission readiness of the inactive facility

f) Importance of the inactive facility.

3.2.3 Annual Inspection Summary (AIS). The AIS is a summary of unfunded maintenance and repair deficiencies identified throughout the year by a comprehensive and planned continuous inspection program. All shore activities included within the scope of OPNAVINST 11010.34B, will prepare AIS documents. Reporting activities must list all real property facilities for which they have maintenance funding responsibilities, even if there are no reportable deficiencies. List deficiencies only if they are $1,000 or greater.

There are three types of AIS:

a) Type A - for Navy owned and operated property, including facilities operated by contractors for research and development, not outleased or declared surplus.

b) Type B - for Navy property, except industrial facilities outleased, declared surplus, or sold with a recapture provision. Also included is property from activities that have been disestablished and are not covered by Type A or C.

c) Type C - For industrial facilities, not Navy operated (Government owned, contractor operated).

Inactive facilities are normally included in the Type B AIS for the activity. NAVFAC MO-322, Vol I, provides instructions for the preparation of this type of AIS. Include excessed facilities in the Type A AIS in accordance with OPNAVINST I1010.34B.

Preparing the AIS for the activity brings together the results of all inspections and maintenance and repair requirements generated throughout the year. This accumulation of necessary actions can be incorporated into a maintenance action plan for the upcoming year. Included in this list are the necessary caretaker maintenance actions for upkeep of the inactive facilities.

3.2.4 Records and Reports. Key to any good maintenance system is adequate documentation of items that must be maintained. The condition of these items must be described, and sufficient nomenclature must be provided to allow ordering of replacement parts. In addition, documentation of maintenance standards and frequencies is essential for planning, executing, and providing quality control of maintenance programs. Records and reports must be tailored to the individual activity, depending on its particular organization and maintenance philosophy. At a minimum, the following types of information should be documented:

3.2.4.1 Current Maintenance Records. Records should be kept in sufficient detail *to* document the following information:

a) The identity of each major structure, equipment item, group of items, or system.

b) Current maintenance status of each (active, inactive and excess), including unfunded deficiencies (by types, critical and deferrable) and uncompleted job orders.

c) Current status of any special project designs or construction.

d) Past maintenance history of each, including description and cost of major repairs or replacement.

e) Additional information, as required, for AIS input.

f) Recommendations for future programmed repairs or replacements, including estimates of funds or manpower requirements.

g) Schedules for future inspections, tests, or maintenance procedures where programmed or otherwise required.

3.2.4.2 Historical Records. Historical records are of particular importance in documenting original, as-built conditions and any subsequent modifications. They become the basis for future planned upgrades or changes. Also preserve original manufacturers operating and maintenance manuals and parts lists. They can be valuable for older equipment whose parts are hard to find.

3.2.4.3 Requirements of Other Government Agencies. Records of tests and inspections of certain systems, structures, and equipment components may be required by other Government agencies like the Coast Guard, the EPA, and the Department of Labor.

3.3 Specific Caretaker Inspection and Maintenance Requirements

3.3.1 General. The paragraphs that follow address inspections and maintenance required for various buildings, structures, and systems.

3.3.2 Building Inspection. At a minimum, make annual inspections of roofs, joints around door frames and window frames, and other joints in wood and masonry structures that usually are caulked. Also inspect immediately after severe storms or earthquakes. Roof trusses, particularly large timber trusses, should also be inspected annually. When necessary, take minimum maintenance measures to ensure stability of wall and roof framing under snow and wind loads.

a) Inspect foundations and underframing of buildings and other structures annually to detect termite or similar infestations and rot. Make a survey of the premises and schedule maintenance and repair. Assistance can be obtained from the EFD applied biologist.

b) Schedule periodic inspections to ensure that the facilities are properly policed.

3.3.3 Building Equipment Inspections. Inspect interior equipment and test prior to storage to ensure that it is worth storing. Test and inspect this equipment and test during storage to reveal conditions that may be corrected before any deterioration has passed economical recovery limits. The frequency and type of inspection is dependent upon the type of equipment, shut-down procedure, environmental conditions of storage, and degree of readiness desired.

3.3.4 Specialized Inspections. Specialized inspections may be required for certain equipment and facilities. Any specialized inspections will be administered by the EFD, which should be informed of those items being inactivated. The EFD will then initiate any necessary modifications to the specialized inspection program.

3.3.5 Interior Electric Equipment. If manpower and electric service is available, operate motors and generators under light load for two hours each month. If operation at monthly intervals is impossible or impractical, operate a lamp or small heater continuously under the motor and generator covering, and make warm-up runs every six months. When neither of the preceding options are practical, cover motors and generators or prepare for preservation per para. 2.1.5 to reduce the intake of moisture by air circulation.

3.3.6 HVAC Systems. As instructed by this manual, most HVAC systems are cleaned, sealed, and protected during inactivation. This prevents starting the system up. At a minimum, all controls, rotating equipment, valves, dampers, and any other moving parts should be exercised twice yearly to prevent corrosion freeze-up. Manufacturer’s literature should also be consulted for other caretaker maintenance procedures.

3.3.7 Batteries. Specific gravities of individual cells should be maintained to manufacturer’s specifications, and equalizing charges should be applied when required. Storage batteries for alarm systems must be kept charged.

3.3.8 Interior Water and Sanitation. Periodic inspection of all traps should be made for possible evaporation of the antifreeze. Where temperatures are above 40 degrees F, all traps should be inspected periodically and kept filled with water or other suitable fluid to the normal water seal height. Dead end lines should be flushed regularly, and main valves should be tested at intervals.

3.3.9 Rubber Lined POL Tanks. To keep the gasoline in contact with the floor lining, accumulations of water should be pumped from the sump at least once a month in warm climates and once in 3 to 6 months in cold climates.

Aeration of rubber-lined gasoline tanks will not be required, as the leaded gasoline vapors protect the lining above the gasoline level. If leaded gasoline is not available, use lead additives or another suitable protestant in the tank. When there is any indication that the ground water head may exceed 10 feet, sufficient quantities of gasoline in rubber-lined tanks and of water in other tanks should be maintained to prevent flotation.

3.3.10 Railroad Right-of-Way. Maintain drainage facilities to prevent serious damage to the track structure. Maintain trestles, culverts, inlets, and drains in the normal manner.

3.3.11 Vegetation Control. Keep grass within 25 feet of all combustible structures cut to a height of less than 2-1/2 inches. All other areas should be cut as needed, but at least once per year, for fire control. Grass should never be cut shorter than 1-1/2 inches. Weeds should be cut as often as necessary to prevent the formation of fire hazards and the destruction of grasses. For the same reason, remove all clipped materials from the area. Refer to NAVFAC MO-100.1 for further details.

3.3.12 Insect and Rodent Control. The minimum amount of insect and rodent control work necessary to protect the health of personnel and to prevent damage to property, food, and equipment should be maintained in accordance with the applicable requirements of NAVFAC MO-310, Military Entomology Operational Handbook. Tanks in water supply and sewage disposal plants discontinued from service should be treated for mosquito control at regular intervals. Tanks that are treated should be tagged with the date of treatment. Mosquito control ditches should be protected from damage and sufficiently repaired to prevent the formation of mosquito breeding places. All fly breeding should be eliminated.

3.3.13 Roads and Grounds. Storm sewers and drainage ditches should be maintained when required to prevent damage to roads, runways, tracks, and structures. In temperate zones, ditches should be repaired in the spring and maintained through the summer; in the tropics, maintenance should be continued throughout the year. Conditions that cause the formation of pools or that retard flow in ditches should be corrected; banks should be kept smooth, and all debris, silt, and mud should be removed. Drainage structures such as culverts, inlets, and catchbasins should be kept clean and at full efficiency to prevent flooding and storm damage.

Parking and storage areas should be maintained as required for the comparable class of road pavement, including preservation of drainage. Traffic aids, including guard fences, markings, signals, and signs, should not be maintained or renewed. Weed mowing of shoulders and right-of-ways should be limited to that required for proper drainage, fire inspection, control of noxious weed growth, and to prevent formation of insect breeding places. Snow removal is required on roads, streets, walks, airfields, and other paved areas only to the extent necessary to provide access for maintenance, fire

protection, and similar activities. Remove snow around fire hydrants to make them accessible to firefighting personnel and apparatus. It may be necessary to remove snow and ice to provide connections to the established drainage systems and to maintain drainage openings to their full capacity.

When practicable, a wobble-wheeled roller should make low speed passes over all well used bituminous surfaces at least once during the summer months when the outside temperature is above 75 degrees F.

3.3.14 Bridges. Bridges should be periodically inspected for verification of structural integrity in accordance with NAVFAC MO-126, Inspection of Bridges and Trestles. Corrosion or physical damage that threatens the continued survivability of bridges should be repaired as necessary.

3.3.15 Boiler Plants. Boiler settings should be inspected periodically to guard against sweating and corrosion of the external surfaces of the pressure parts. Use of coke jacks or similar heating stoves at convenient points may be necessary during extended spells of damp weather accompanied by a rising temperature. The discontinued portions of gas-burner systems should be checked periodically with a pressure gauge to ensure that leaking valves are not allowing gas to enter areas withdrawn from service.

3.3.16 Drydocks

3.3.16.1 Inspection. Para. 3.1.2 details the types of inspections, and Appendix A lists suggested inspection frequencies for drydock-associated equipment and systems. The actual frequency of these inspections should be determined by the activity and included in the caretaker maintenance planning. Additional factors in determining the inspection frequencies are the anticipated time of inactivation, the expected future mission, and the economics of maintaining the structures and equipment.

Included in this planning effort should be a detailed inspection to be made 30 to 60 days after inactivation is completed. The condition of the pumps, motors, valves, mechanical equipment, electrical equipment, underwater hull of the entrance caisson, sluice, and stop log gates should be determined. Effects of corrosion, verdigris, tarnish or mildew should be estimated. Inspections should disclose where exterior surfaces and equipment require preservation.

3.3.16.2 Pumps. Drainage pumps left operable for disposal of rainwater and leakage in the dock and caisson should be checked monthly and after heavy rains for evidence of failure. For drydocks with the caisson left in place, test run the pumping capability every 90 days and perform minor operator maintenance. Pumps should be overhauled and repaired as required, including suction and discharge system and electrical controls. Periodic inspection of stop logs is necessary to ensure watertightness of the pumpwell.

3.3.16.3 Alarm Systems. Test alarm systems quarterly. When possible, a station manned 24-hours per day should monitor remote water level alarms. A roving operator should make periodic checks of pump wells.

3.3.16.4 Dehumidification. Through the observation ports and without entering dehumidified spaces, weekly checks of the relative humidity should be made and recorded. An average humidity of 35 percent should be maintained. Erratic operation of mechanical dehumidifiers, or continuous operation for unusually long period of time is an indication of leakage requiring investigation. Humidistats should be checked and adjusted monthly for accuracy of control and sensitivity at a dry-bulb temperature equal to the pumproom temperature. Entry to the dehumidified spaces, following oxygen and gas tests, should be limited to inspection of equipment therein and emergency repairs/services of the dehumidifiers pump motors and control equipment. Always close access doors as quickly as possible, and check that they are provided with well-fitting airtight gaskets, and marked: “KEEP CLOSED--DEHUMIDIFIED AREA.” Inspect all other openings connecting dehumidified spaces with the weather to be sure seals are intact.

3.3.16.5 Corrosion. Annually inspect all exposed metal, concrete surfaces, and timber blocking for corrosion and deterioration while the drydock is dewatered. Defects noticed in corrosion control system coatings and cathodic protection should be corrected in accordance with methods and materials used at inactivation.

3.3.16.6 Leaks. Dewatered drydocks and inactivated caissons should be checked for the development of new leaks quarterly; significant leaks should be eliminated. Minor leaks should be recorded and kept under observation as required.

3.3.16.7 Clean-up. The coping areas, dock chamber, pipe gallery, and tunnels should be kept free of trash, debris, and accumulations of all sorts. Storage of material of any type in and adjacent to inactivated drydocks should be only by authorization.

Section 4: WHOLE BASE CLOSURE OR INACTIVATION

4.1 Introduction. Base closure as used in this section and throughout this handbook means deactivating a Navy shore base and removing the land and facilities from the Navy's plant account. Base closure is not the same as base inactivation. The term "closure" is used when the Navy permanently gives up its property; inactivation is used when the property is retained by the Navy but kept in an inactive or "moth-balled" status.

4.2 Impact of Closure. Any time an entire naval installation is closed, all employees are transferred or released, and all facilities are transferred or demolished, there is a major impact on all involved. NEPA documentation is required to assess the impact of a base closure. Particular areas of study will include land use, area employment, environmental hazards and any other concerns. They will then publically disclose the findings of the study. If adverse effects are found, mitigating measures could be required during closure. Consult with the NAVFAC Environmental Branch for the necessary expertise.

4.3 Demolition. When an entire base is closed, there is normally very little demolition performed. Facilities on the base are assets that have value to the prospective new owner. However, where facilities are demolished, coordination becomes critical. A facility must be vacated, and salvageable equipment must be removed before it is demolished. Hazardous materials require removal in compliance with the Resource Conservation and Recovery Act (see para. 1.4). Additionally, demolition contracts must be developed, awarded, and executed. This requires considerable effort at a time when public works resources are scarce. The process must be accomplished in an expeditious manner so that it can be complete prior to turnover of the land to GSA or some other new owner. Further, demolition should be completed as soon as possible to avoid potential safety and security problems.

4.4 Inactivation. If the whole base is to be inactivated, all facilities structures, utility systems, and grounds will require some preparation. Guidance on how to accomplish this effort is contained in Section 2. The steps required to inactivate and "moth ball" facilities are not individually complex, but when every facility must be inactivated at the same time the work force is being phased out, careful planning and detailed record keeping are essential. The decision to inactivate vice close a base presumes some future need. If facilities and systems are not adequately protected in the process of inactivating, they will require significantly more effort and expenditure of resources to reactivate.

4.5 Closure. Whole base closure also requires careful planning and detailed record-keeping. Since the base is no longer required by the Navy and will be transferred to a new owner, expenditure of Navy resources to preserve it should be kept to a minimum. However, the process usually takes a relatively long time to accomplish, and in the interim, the Navy has a

responsibility to keep the facility safe, secure, and reasonably maintained. Depending on the local situation, the Navy may retain custody for several years; this will require establishment of some form of caretaker maintenance and security force. Additionally, even though the Class I (land) and Class II (real property) properties will be transferred to a new owner, there will be equipment, material, tools, furniture and numerous other Navy assets available for reassignment. Decisions must be made on what items to remove from the base and transfer to other Navy organizations before buildings and structures are transferred to GSA. Accountability of all this material must be maintained to protect the taxpayer's investment in it.

Because of the turmoil surrounding the base closure decision, a stable workforce will not be available to complete all tasks the Public Works Department must accomplish. Public Works management should identify a skeleton organization early in the process. Activity management should develop a staffing plan for this skeleton organization, normally composed primarily of military personnel. As regular employees leave, their responsibilities are transferred to the skeleton work force. An alternative to the skeleton work force is to contract those functions that remain to be accomplished.

4.6 Whole Base Closure or Inactivation Planning. In the process **of** planning for a whole base closure or inactivation, Public Works Management must answer several preliminary questions, namely:

a) How long should Public Works services be provided and to what level?

b) At what rate should Public Works Department employees be released?

c) What residual or caretaker work force is required? Will it be staffed with military, government civilians, or by contract?

d) What support will other station departments and tenants require to vacate their facility?

e) To what level should inactivated facilities be preserved?

f) What will happen to USN-numbered equipment, Public Works shop equipment and tools, and Public Works material in the warehouse?

g) How long should utility services be provided? What residual utility services will be required?

h) When should facility support contracts be terminated? What residual contracts are required?

i) What resources (dollars and people) are available to Public Works?

j) What records, reports, and documentation should Public Works create or maintain?

APPENDIX A
SUGGESTED MINIMUM CONTROL INSPECTION FREQUENCIES

Structural	Years	Remarks
Buildings (Except Roofs and Trusses)	2	
Chimneys and Stacks	2	after any storm
Furniture		no control inspection required
Roofs	1	NAVFAC MO-113, para. 2.1.2, also applies
Trusses	1	wood-annually; steel- every 5 years
Swimming Pools	1	
Antenna Supporting Towers Masts	2	all over 200 feet in height and done on contract
Brows and Gangways	1	
Camels and Separators	1	
Dolphins	1	
Dredging, Fleet Moorings, and Navigation Aids	3	NAVFACINST 11153.4B applies for fleet moorings
Fuel Facilities (Receiving and Issue)	1	
Piers, Wharves, Quaywalls, Bulkheads, and Other Waterfront Facilities	1	
Seawalls, Groins, and Breakwaters	1	and after any storm
Ammunition Storage (Above Ground) - Permanent Construction	2	
Grounding System	6 mos	
Fuel Facilities (Storage)	2	

Structural	Years	Remarks
Bridges and Trestles	2	
Fences and Walls	2	
Fresh Water Storage	1	
Grounds - Erosion Control and Drainage	1	
All Other	3	
Incinerators	2	
Pavements	1	
Railroad Trackage	1	include trackage for weight handling equipment
Refuse and Garbage Disposal (Sanitary Fill)	1	
Retaining Walls	2	and after severe storms
Storm Drainage Systems	1	and after severe storms
Tunnels and Underground Structures	2	
Aircraft Power Check Facility	1	
Air Conditioning Systems	1	
Bakery Equipment	1	
Weight Handling Equipment		P-300 criteria applies
Dishwashing Equipment and Accessories	1	
Domestic Refrigerators and Freezers	1	
Elevators, Platform Lifts, Dumbwaiters, and Escalators	1	

Structural	Years	Remarks
Food Preparation and Food Service Equipment	1	
Heating Equipment (Bldgs)	1	
Plumbing (Bldgs)	2	
Ventilating and Exhaust Air Systems - Galleys and Hospitals	1	
Exhausts for Flammable or Toxic Fumes	1	
All Other	2	
Water Heaters	1	
Fuel Facilities (Distribution)	1	
Aeration Equipment (Water)	1	
Aeration Systems (Sewage)	1	
Boilers	1	
Chemical Feed Equipment for Water Supply	1	
Chlorinators and Hypochlorinators	1	
Fresh Water Supply and Distribution Systems	1	
Gas Distribution Systems	1	
Pumps (Sump and Bilge)	1	
Septic Tank Systems	1	
Sewage Collection and Disposal Systems	1	
Sewage Pumps	1	

Structural	Years	Remarks
Sewage Screening, Grinding, and Grit Removal Equipment	1	
Sludge Pumps (Reciprocating)	1	
Steam Traps	1	
Turbine Surface Condensers	1	
Turbines (Large)	1	
Turbines (Small)	1	
Unfired Pressure Vessels	2	
Piping for Gas Systems	1	
Capstans and Winches		P-300 criteria applies
Electrical Power Plants	1	
Aerial Telephone Cable	2	
Buried and Underground Telephone Cable	3	
Disconnecting Switches	2	
Distribution Transformers, Deenergized	1	Dry - Annually; Wet - Two Years
Distribution Transformers, Energized	1	
Electrical Grounds and Grounding Systems	1	
Electrical Instruments	2	
Electrical Potheads	2	
Electrical Relays	1	
Lightning Arresters	1	
Open Wire Telephone Lines	2	

Structural	Years	Remarks
Power Transformers, Deenergized	1	
Power Transformers, Energized	1	
Safety Fencing	1	
Steel Power Poles and Structures	3	
Vaults and Manholes (Electrical)	2	
Wood Poles and Accessories	2	
Cathodic Protection Systems	6 mos	
Electric Motors and Generators	1	
Electrical Systems (Bldgs)	2	
Electric Systems (Waterfront Facilities)	1	
Fuses and Small Circuit Breakers	2	
Rectifiers	2	
Switchgear (Bldgs)	1	
Telephone Substations	2	

APPENDIX B
INACTIVATION/CLOSURE CHECKLISTS

PUBLIC WORKS OFFICER

- Establish residual organization (in-house civilian/military or contract).
- Coordinate with other departments and the EFD Facilities Management Engineering Division to provide required service.

FACILITIES MANAGEMENT ENGINEERING DIVISION

- Establish job orders for inactivation/closure actions.
- Establish job orders and POA&M for caretaker maintenance.
- Coordinate required services.

REAL ESTATE

- Prepare Class I and Class II inventory records for transfer.
- Terminate/modify leases, licenses, and use agreements (coordinate with EFD).

CONTRACTS

- Terminate/modify facility support contracts (co-ordinate with OIC).
- Terminate/modify transportation, operations, and maintenance contracts (bus service, taxi service, wrecker service, etc.).
- Terminate/modify purchased utility contracts (responsibility of EFD Code 09B).
- Terminate/modify construction contracts (coordinate with OICC/OIC).
- Terminate/modify timber sale contracts.
- Terminate/modify A/E contracts.

ENVIRONMENTAL/NATURAL RESOURCES

- Modify/cancel discharge permits.
- Modify/terminate/continue environmental monitoring actions.
- Close disposal sites and land fills.
- Transfer hazardous waste held in temporary storage facility.
- Evaluate inactivation/closure actions for potential environmental impact.
- Prepare environmental records for transfer (PCB transformers, asbestos surveys, underground tanks, land fills, endangered species management, wetlands mitigation, etc.).
- Coordinate with local, state, and EFD environmental and natural resource management agencies.

INTER-GOVERNMENTAL CO-ORDINATION

- Local city government.
- Local county government.
- State government.
- Area clearing house.
- Adjacent DOD activities/tenants.

  Navy tenants.

  Other Federal agencies/tenants.

TRANSPORTATION

- Transfer/dispose of USN-numbered equipment.
- Transfer/dispose of other equipment and tools.

BUILDING DEACTIVATION

- Make building weathertight (repair roof, cover openings).
- Allow for ventilation, open blinds, etc.
- Provide required humidity control and heating.
- Open all interior doors and windows. Secure keys next to door.
- Secure all exterior doors and hang keys on inside of door.
- Designate one door for entry and provide hasp and padlock or other suitable lock.
- Duplicate all keys and store in a suitable location for a future use.
- Cover sensitive equipment to protect from dust, dirt, and water.

  Unplug all equipment from wall outlets.
- Secure utility services at convenient location (steam, water, power), unless partial utility service is required.
- Drain all water, steam, and sewer lines. Provide anti-freeze or some other fluid for areas that cannot be drained (traps, water seals).
- Secure telephone service to building.
- Remove all highly flammable material (solvents).
- Disconnect and drain water coolers, kitchen equipment, etc.
- Remove items to be disposed of or transferred.
- Provide general cleanup after other work is accomplished.
- Provide signs for exterior of building indicating it is secured, date secured, and telephone number to report emergencies.

REFERENCES

NOTE : THE FOLLOWING REFERENCED DOCUMENTS FORM A PART OF THIS HANDBOOK TO THE EXTENT SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED IN THE TEXT, USERS OF THIS HANDBOOK SHOULD UTILIZE THE LATEST REVISIONS OF THE DOCUMENT CITED HEREIN .

FEDERAL/MILITARY SPECIFICATIONS, STANDARDS, BULLETINS, HANDBOOKS, AND NAFVAC GUIDE SPECIFICATIONS:

Unless otherwise indicated, copies are available from the Naval Publishing and Printing Service Office (NPPSO), Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

SPECIFICATIONS

MIL-L-9000H	Lubricating Oil, Shipboard Internal Combustion Engine, High Output Diesel
TT-C-598	Calking Compound, Oil and Resin Base Type (for Masonry and Other Structures
TT-V-51F	Varnish: Asphalt

STANDARDS

MIL-STD-101B	Color Code for Pipelines and for Compressed Gas Cylinders
MIL-STD-1625C	Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for U.S. Navy Ships

HANDBOOKS

MIL-HDBK-1OO8A	Fire Protection for Facilities Engineering, Design and Construction

NAVY MANUALS, P-PUBLICATIONS, AND MAINTENANCE OPERATING MANUALS:

Available from Commanding Officer, Naval Publications and Form Center, (NPFC), 5801 Tabor Avenue, Philadelphia, PA 19120-5099. To order these documents: Government agencies must use the Military Standard Requisitioning and Issue Procedure (MILSTRIP); the private sector must write to NPFC, ATTENTION: Cash Sales, Code 1051, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

P-PUBLICATIONS

NAVFAC P-73	Real Estate Procedures Manual
NAVFAC P-442	Economic Analysis Handbook

MAINTENANCE OPERATING MANUALS

NAVFAC MO-100.1	Natural Resources Land Management
NAVFAC MO-102	Maintenance and Repair of Surfaced Areas
NAVFAC MO-103	Maintenance of Trackage
NAVFAC MO-104	Maintenance of Waterfront Facilities
NAVFAC MO-114	Building Maintenance, Plumbing, Heating and Ventilating
NAVFAC MO-116	Facilities Engineering, Electrical Interior Facilities
NAVFAC MO-117	Maintenance of Fire Protection Systems
NAVFAC MO-126	Inspection of Bridges and Trestles
NAVFAC MO-230	Maintenance and Operation of Petroleum Fuel Facilities
NAVFAC MO-310	Military Entomology Operational Handbook
NAVFAC MO-312	Wood Protection
NAVFAC MO-321	Facilities Management
NAVFAC MO-322	Inspection of Shore Facilities
NAVFAC MO-324	Inspection and Certification of Boilers and Unfired Pressure Vessels
NAVFAC MO-913	Historic Structures Preservation Manual

OTHER GOVERNMENT DOCUMENTS AND PUBLICATIONS:

NAVY CIVIL ENGINEERING LABORATORY

TDS 77-09	Coating Interiors of Steel Potable Water Tanks

NAVY DEPARTMENTAL INSTRUCTIONS:

Available from Commanding Officer, Naval Publications and Forms Center, ATTN: Code 3015, 5801 Tabor Avenue, Phialdelphia, PA 19120-5099.

NAVFACINST 11330.14	Safe Drinking Water at Navy Shore Activities
NAVSEAINST 11420.2	Drydocking Facilities; Safety Certification Criteria for Docking U.S. Navy Ships
OPNAVINST 5090.1	Environmental Protection and Natural Resources Manual
OPNAVINST 11000.16	Command Responsibility for Shore Activity Land and Facilities
OPNAVINST 11010.34B	Instructions for Preparation and Submission of the Type "A" Annual Inspection Summary and Narrative Assessment

CUSTODIAN
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PREPARING ACTIVITY
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions-Reverse Side)

1. DOCCUMENT NUMBER	2. DOCUMENT TITLE
MIL-HDBK-1130	INACTIVATION, CARETAKER MAINTENANCE, REACTIVATION, AND CLOSURE OF SHORE FACILITIES

3. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS (Street, City, State, ZIP Code)

4. TYPE OF ORGANIZATION (Mark one)

- ❑ VENDOR
- ❑ USER
- ❑ MANUFACTURER
- ❑ EFD/PWD
- ❑ AE
- ❑ CONTRACTOR
- ❑ OICCROICC
- ❑ OTHER (Society): _____

5. PROBLEM AREAS

a. Paragraon Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional	b. WORK TELEPHONE NUMBER (Include Area Code) - Options:
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional	a. DATE OF SUBMISSION (YYMMDD)

INSTRUCTIONS: In a continuing effort to make our standardization documents better. the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (DO NOT STAPLE), and mailed. In block 5, be as specific as possible about particular problem areas such as working which required interpretation. was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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