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Inspection Of Shore Facilities

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FOREWORD

A major problem facing Facility Managers is the physical condition of the shore establishment. Advancing deterioration frequently threatens operational readiness. In times of declining resources there is a tendency to condone breakdown maintenance versus planned maintenance and to reduce or curtail Facility inspections. This results in poorly defined and understated maintenance and repair resource requirements and condition. Facility Managers are always in a position of justifying resource needs to decision makers. At higher levels, programs are evaluated not only on need, but on mission readiness impact while recognizing available resources cannot fully fund all programs. Documentation of real property condition and its effect on operational readiness is critical in justifying budget requests. Facility condition is determined by accurate facility inspection. It is both the cornerstone of a sound Facility Management System and the bedrock on which it is built. Without good facility condition information and a common sense approach to Facilities Management it is difficult to exercise good stewardship over assigned assets and supporting resources.

This manual contains policy and criteria for inspection and condition assessment of shore facilities and preventive maintenance of equipment. It provides guidance to implement and maintain an inspection/assessment system. Comprehensive inspection by technically qualified personnel is the key to helping protect Real Property investment. An effective facilities management program avoids over/under maintenance. It fosters timely corrective action before advancing deterioration causes major repairs, or impacts mission.

Application of maintenance standards will effectively and efficiently protect personnel and property at a cost commensurate with facility functional requirements. Use of this guidance will assure economical maintenance and maximum reliability of facilities and equipment. Additional information or suggestions to improve this publication are invited and should be submitted through appropriate channels to the Naval Facilities Engineering Command (Attention: Code 163), 200 Stovall Street, Alexandria, VA 22332-2300. This publication supersedes **NAVFAC MO-322 Vol I of July 1977.**

This publication has been reviewed in accordance with the Secretary of the Navy Instruction 5600.16A and is certified as an official publication of the Naval Facilities Engineering Command.

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CAPTAIN, CEC, U.S. Navy
Assistant Commander for
Public Works Centers and Departments

ABSTRACT

This publication establishes the Continuous Inspection Program for Real Property facilities and equipment. Practices and procedures are recommended to ensure facility and equipment safety, reliability and readiness at optimum cost.

The contents of this manual contain definitions and recommended standards for the Shore Facilities Inspection/Assessment System; inspection frequency and times, procedures and types; suggested guidelines for records and reports; procedures for condition assessments; discussions of the Annual Inspection Summary and facility maintenance planning.

CHANGE CONTROL SHEET

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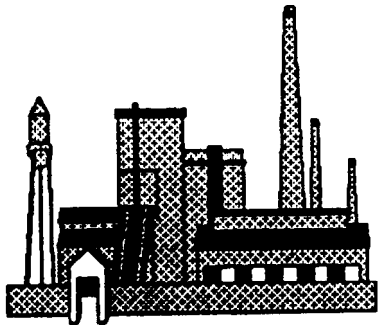
CHAPTER 1. INTRODUCTION

1.1 PURPOSE. This manual is a guide for personnel who operate, inspect, test, certify, assess the condition of, and maintain shore facilities and equipment. It provides criteria, standards and procedures for development and implementation of a comprehensive Inspection/Assessment System.



1.2 OBJECTIVE. The objectives are to:

(1) systematically identify deficiencies,

(2) recommend action that will correct deficiencies and/or impede advancing deterioration, and

(3) maintain facilities and systems at a level consistent with mission.

1.3 DISCUSSION. Facility acquisition costs are minuscule in comparison to life cycle maintenance costs associated with facility ownership. While design and construction are challenging and rewarding from the aspect of satisfying a real facility need, there is little glamour for the facility manager who must make the difficult daily funding decisions that keep the same facilities operational. There is little awareness of cost of ownership and various maintenance strategies which need to be coupled to establish and achieve facility life extension goals. Knowledge of facility condition is critical to an effective facility manager and this knowledge can only be attained by facility inspection. A dedicated inspection effort is vital to properly identify Real Property maintenance and repair deficiencies which will potentially impact mission or degrade plant investment. This manual outlines methods to identify and quantify deficiencies and their mission impact. Inspection by-products are: (1) an accurate assessment of facility condition and the potential impact on readiness by Investment Category/Base Readiness Mission Category (BASEREP) and (2) identification of resource needs for budget planning purposes. Chief of Naval Operations (CNO) requires each major claimant to provide a facility condition assessment (BASEREP), OPNAVINST 3501.167 (series) and Annual Inspection Summary (AIS), OPNAV 11010.34 (series) annually. Overall Navy assessments are then prepared by OPNAV which portray the long-term impact of resource allocation decisions. Assessments and resource allocation decisions are adjusted annually for a six-year projection (Future Years Defense Plan - FYDP).

1.4 SCOPE. This is the first of three volumes which describes investigations and evaluations needed to effectively manage facilities and equipment (excluding transportation) for which Public Works is responsible. These volumes contain no instant magical solution to Facility Management and condition problems. They do, however, provide a

logical systematic approach providing Facility Managers with information needed to make sound decisions based on economics and mission support.

1.4.1 Volume l-Inspection/Assessment System. Chapter 1 assigns responsibilities for the maintenance of shore facilities. Chapter 2 describes the Inspection/Assessment system. The remaining chapters (3 through 8) provide detailed inspection guidance.

1.4.2 Volume 2-Control Inspection Checklist. This volume provides inspection checklists for use by technical Control Inspectors.

1.4.3 Volume 3-Instructor's Manual for Control Inspector Training Course. This volume provides a training plan for conducting an Inspector Training course to teach Control Inspectors how to assess, evaluate and document facility deficiencies.

1.5 RESPONSIBILITIES. OPNAV Instructions 11010.23 (series) and 11000.16 (series) contain CNO's management concepts for Real Property Maintenance Activities (RPMA). These instructions convey CNO policy for facility inspections and condition assessments and assign organizational responsibilities. Embedded in this policy and guidance is an attempt to achieve a state of equilibrium between the functional value of facilities to mission and the financial resources available to support the shore establishment.

1.5.1 Activity Responsibility. Commanders, Commanding Officers and Officers-in-Charge of Shore Activities having plant account custody of land or facilities (Class I and II Real Property) respectively are responsible to the CNO through their major claimant for prudent planning and plant maintenance. This includes identifying and reporting resource requirements, material condition, safety, environmental and appearance deficiencies as well as efficient and effective utilization of assigned assets including funds. Without explicit well defined, well organized knowledge of facility condition, it is impossible to successfully plan, fund and execute a Facility Management Strategy.

1.5.1.1 Facilities Management Program. The Commanding Officer is responsible for establishing and maintaining an effective facilities management program such as that specified in NAVFAC MO-321, "Facilities Management" (for Public Works Departments). Performance Standards shall be incorporated into work planning and estimating procedures and variance analyses shall be performed. The cornerstone of a sound facilities management system is a good facilities inspection program. Activities served by a Public Works Center (PWC) or Department (PWD) of another activity are responsible for all functions except execution of work. They are still responsible for accepting the work performed by others.

The Facilities Management Program includes as a minimum:

- Conducting a continuous, comprehensive inspection of Real Property Assets to identify and quantify condition. Maintenance and Repair work generated from continuous inspection shall constitute a minimum of 65% of the nonrecurring work programmed for accomplishment. The Continuous Inspection Program is comprised of 3 types of inspection: Control, Preventive Maintenance and Operator. These are discussed in this volume.
- Training personnel to conduct accurate inspections using approved guidance.
- Establishing and maintaining a Preventive Maintenance Inspection (PMI) program for dynamic equipment.
- Establishing and conducting an Operator Inspection program for equipment and facilities requiring a full time operator.
- Initiating proper and responsive action to correct deficiencies.
- Preparing and submitting an AIS and required assessments to higher authority which accurately reflects facility condition.
- Preparing, maintaining and using maintenance plans developed from a budget based on requirements identified via a comprehensive Continuous Inspection Program.
- Ensuring that Minor Construction/Alteration work, including planning and design, does not interfere with or consume resources needed to plan, estimate or accomplish Maintenance and Repair work. OPNAV Instruction 11000.16 states that expenditures for Minor Construction and Alteration (less Equipment Installation) shall not normally exceed 10% of the total claimant expenditures for Maintenance of Real Property (MRP) without prior approval of CNO (OP-44).
- Reducing the level of maintenance on facilities to be demolished, renovated, replaced or not fully utilized. Maintenance standards, including safety, shall be appropriate to use.
- Making inspectors aware of environmental and energy/utilities conservation program goals and instructing them to document deficiencies accordingly.

1.5.1.2 Facility and Equipment Inventories. Accurate inventories are critical. Essential Class I and II property inventory, including items of dynamic equipment, must be accurately maintained. A facilities manager must know which assets require maintenance, their location, amount of maintenance needed and relative importance of the asset to mission.

1.5.1.3 Safety. Equipment such as safety glasses, shoes, hard hats, gloves, respirators, and belts shall be provided to inspectors as required. Guidance shall be given concerning protective equipment requirements, maintenance and use of equipment, and safety precautions to be observed. Inspections of electric and steam distribution systems, elevators, etc. may require a helper to minimize danger. Inspectors shall observe safety precautions and be familiar with safety instructions. Safety Inspectors and Industrial Hygienists should augment the Control Inspection effort and maintain a dialogue to determine the proper course of corrective action, etc. If these personnel are unavailable, required services should be purchased from other sources (PWC, contract, etc.)

1.5.1.4 Organization. NAVFAC P-318, "Organization and Functions for Public Works Departments," recommends a Work Generation Branch in the Facility Management Engineering Division (FMED). Responsibilities include scheduling and performing facility inspections, preparing inspection reports, and planning and estimating functions.

1.5.1.5 Control Inspector's Duties. Control Inspectors shall:

- Carefully review facility files for reported problems, historical trends and status of planned work prior to a field inspection.
- Be familiar with current space utilization assignments, warranties, inter/intra service support and/or lease agreements.
- Consult with facility occupants regarding known problems prior to inspection.
- Conduct thorough inspections and produce an accurate report with reliable data. Incomplete examinations should be reported. Corrective actions shall be recommended based on personal observation and/or tests or engineering investigations by qualified personnel.
- Recommend other tests or investigations if required.
- Attempt to determine and report the true cause of a problem rather than reporting cosmetic deficiencies.
- Be alert to deficiencies affecting entire systems. Recommend repair by replacement of the system rather than piecemeal, temporary solutions to problems when practical. Indicate when Special Projects should be developed.
- Appraise the effectiveness and quality of repairs to previously reported problems. Report inferior quality work or ineffective fixes. Note failure to perform specified work.

- Evaluate Preventive Maintenance and Operator Inspection Program effectiveness . Recommend changes when needed.
- Prepare cost estimates, by craft, to correct deficiencies.
- Classify deficiencies as Deferrable or Critical (OPNAV Instruction 11010.34 provides guidance.)
- Report changes in space usage.

1.5.1.6 PMI Inspector Duties. Maintenance and Utilities shop personnel are responsible for conducting PMI of dynamic equipment in accordance with specifications provided by the FMED. The FMED is responsible for PMI Program administration. The Maintenance Division and Utilities Division personnel should assist the FME Division in developing inventories, identifying checkpoints, assigning inspection frequencies, planning, scheduling, and appraising PMI effectiveness. Once the Program has been defined, it is the FMED responsibility to issue work authorizations for PMI accomplishment and monitor PMI execution.

1.5.1.7 Supervisor's Duties. The Work Generation Branch Supervisor must assure that each Control Inspector is properly instructed and trained. The Supervisor should review each incoming Customer Work Request to ensure the work is not duplicated on an Inspection Report. If so, the customer should be notified of work status and the Work Request returned. An effectively administered Control Inspection Program will substantially reduce Customer Work Requests for Maintenance and Repair. The Work Generation Branch Supervisor shall conduct random inspections to assure quality. Major unexplained discrepancies between previous and current Inspection Reports are to be resolved with inspectors, including site visits, to evaluate problem areas and ensure the inspector is adequately trained. The FMED Director should randomly review Inspection Reports for completeness, accuracy and validity of reported deficiencies and recommended corrective actions. The Shop Supervisor responsible for executing operator inspection or PMI Work is responsible for training workers, maintaining work quality, promptly reporting out-of-scope PMI deficiencies and suggestions for over/under maintenance.

1.5.1.8 Operator Inspection. Operator Inspection is conducted by the person assigned to operate the equipment or system. It includes examination, lubrication and minor adjustments. Standard Operating Procedures (SOPs) shall be developed and posted on the equipment or facilities, or written in a watch log. During the watch, the operator should note what was done and indicate if major repair or overhaul is needed. Work beyond operator's capability or authority should be reported to the supervisor. Breakdowns should be reported immediately.

1.5.1.9 Management's Appraisal Responsibility. Management shall monitor the "health" of the operation. Indicators exist for continuing appraisal. For ex-

ample, if the percentage of Specific Maintenance and Repair Work generated from Continuous Inspection is less than 65%, the Inspection Program may be ineffective or inspection generated work is not being programmed for accomplishment. Note the level of Emergency work. An increase in Emergency work and a decrease in PMI work may indicate dynamic equipment inspections are not being worked as planned or PMI specifications and frequency may need adjustment. It may also indicate that an item of equipment needs to be replaced versus continual repair. Management indicators and targets are included in the "Management Guide, Maintenance Subsystem, Base Engineering Support, Technical (BEST)" and NAVFAC MO-321 Chapters 10 and 11. These will assist in measuring and monitoring overall program effectiveness. Manual data collection for appraisal is tedious, but simplified with automation.

1.5.1.10 Shore Base Readiness Report (BASEREP). OPNAV Instruction 3501.167 (series) establishes procedures for assessing the readiness of Navy shore activities. Readiness data helps justify resources for shore establishment. The BASEREP (Figure 1-1) is an operator's assessment of base readiness. Commanding Officers evaluate readiness of assets (personnel, facilities, and equipment) by Mission Category. Rating factors are used to assess readiness capability by mission area. These are:

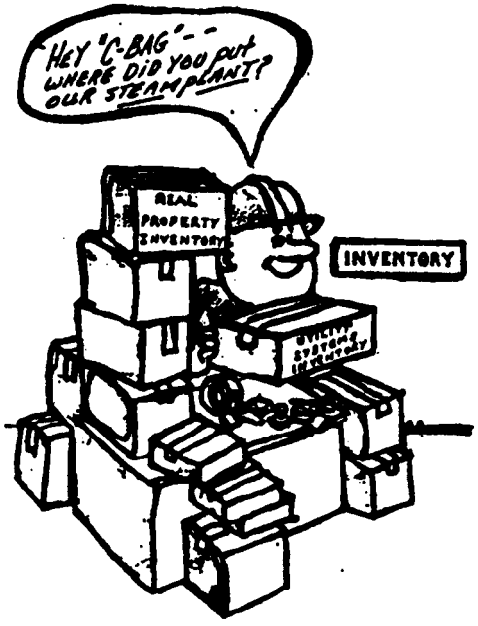
- C1 - Asset has fully met all demands in the Mission Category throughout the reporting period;
- C2 - Asset has substantially met all demands of the Mission Category throughout the reporting period with only minor difficulty;
- C3 - Asset has only marginally met demands of the Mission Category throughout the reporting period, but with major difficulty;
- C4 - Asset has not met vital demands of the Mission Category.

BASEREP ratings for "Condition" of facilities must be supported by Facility Inspection Reports. Inspection Reports also provide repair solutions required by CNO for BASEREP ratings of C3 and/or C4.

1.5.2 <u>Claimant Responsibilities.</u> A synopsis of Claimant RPMA responsibilities outlined in OPNAV Instruction 11000.16 follows:

- Issue guidance and instructions for administration and management of assigned land and facilities.
- Maintain a qualified staff to administer land and facilities matters. Utilize Naval Facilities Engineering Command (NAVFACENGCOM) technical assistance.
- Provide training for personnel whose decisions affect land and facilities or the resources to acquire, maintain or dispose of them.

CHAPTER 2. SYSTEM DESCRIPTION



2.1 PURPOSE. This chapter describes an Inspection/Assessment System designed to determine facility and equipment condition and proper corrective measures to obtain maximum utilization and readiness at minimum cost. It discusses the continuous inspection program, types of inspections, inventories, standards and inter-relationship of inspection programs. The procedures provide systematic methods for identifying and reporting maintenance and repair work on a continuous basis and arrangement of data for management decisions based on priority.

2.2 INVENTORIES. Inventory data is basic to effective maintenance planning. Inventories should be verified and updated during inspections.

2.2.1 Real Property Inventory. Real Property Inventory for Class I and Class II property owners is contained in NAVFAC Manual P-164, "Detailed Inventory of Naval Shore Facilities." It is the basic reference for Control Inspection. Facility usage should be reviewed during inspection and the activity Facility Planner notified of changes. Real Property Inventories are the responsibility of activity Facility Planners. Changes to property record cards shall be reported to the geographic EFD's/EFA's Facilities Planning and Real Estate Department. The EFD/EFA will make revisions to the Navy Facilities Assets Data Base (NFADB) which will be reflected in revised NAVFAC P-164 publications.

2.2.1.1 Utility Systems Inventories. Utility systems and components are difficult to identify because facility numbers are not usually assigned. Pseudo facility numbers may be assigned. Utility pseudo facility numbers should be composed of at least two factors: (1) utility service code and (2) descriptive type service. Appendix A provides a pseudo facility numbering guide. Inventories of systems and components are the basis for developing preventive maintenance inspection and service of equipment. Inventories should be sorted so frequency of inspection, priority data, replacement information, etc. can readily be determined.

Listings should indicate systems or components that, if disabled, would:

- Disrupt essential mission-related operations.
- Endanger life and/or property.

- Impair quality of life.
- Cause environmental problems.
- Require a long lead-time for replacement.

2.2.2 Systems Inventory. A systems inventory shows all vents, pipes, anodes, rectifiers, valves, inspection access, motors, traps, filters, and other components for a single system. Within each system a separate sublist may indicate components requiring preventive maintenance and those that are repaired by replacement. Each system requires inspection and is the responsibility of both Control Inspectors and Preventive Maintenance Inspectors depending on the type inspection performed.

2.2.3 Preventive Maintenance Inspection (PMI) Inventory. A PMI inventory is a listing of items of dynamic equipment requiring periodic lubrication, adjustment and/or inspection. PMI of equipment with an assigned operator is generally part of the operator's SOPs, especially if failure would have serious consequences. If the operator does not have time or training to perform the work, it should be included in the PMI program. PM Inspection is particularly applicable to unattended:

- Water supply, treatment, and distribution systems.
- Sewage collection and treatment systems.
- Fuel storage and handling facilities.
- Compressed air and industrial gas generating and distribution systems.
- Electric generating and distribution systems.
- Appurtenants to cathodic protection equipment systems.
- Heating, ventilating, refrigeration, air conditioning equipment and systems.
- Bakery, food preparation and service, and dish washing equipment.
- Weight-handling equipment.
- Public Works shop equipment.

2.2.4 Replacement Items Inventory. Small items such as fractional horsepower motors, water coolers, self-lubricating fans, window unit air conditioners, automatic door closers and other sealed units do not normally require preventive maintenance unless critical to a mission essential operation. These items are replaced when they break down. Control Inspection of systems and user complaints (numerous E/S calls) also identify the need to replace items. An inventory of such items, with replacement dates, including stock or availability data should be maintained.

2.2.5 Real Property Baseline Inventory. The Baseline Inventory expands upon the Real Property Inventory and gives detailed information on components or sub-components. It is used to identify unique/special inspection, certification, or maintenance requirements for use in Facilities Support Contracts or work scheduling. It should contain such items as the number and kind of piles supporting a pier, the total number of railway ties in the system and number in the replacement program. Square feet of roofing by type and facility, length of a distribution system section according to size and type of pipe (including cathodic protection and rectifiers), and other detailed information should also be included.

2.3 INSPECTION TYPES. The Continuous Inspection Program is comprised of three types of inspection: (1) Operator, (2) Preventive Maintenance, and (3) Control. Effective planning and execution of these inspections ensures a comprehensive examination of all facilities and equipment.

2.3.1 Control Inspection (CI). Control Inspection is a scheduled structural, mechanical and electrical examination of facilities conducted throughout the year to determine physical condition. CI is the cornerstone of the Continuous Inspection Program. Other types of inspections such as command, safety inspections and user inspections can supplement and support Control Inspections. It is advantageous to encourage informal reports from Master-at-Arms, building "monitors," and facility occupants. Booklets or written instructions on the care and operation of components of a facility for occupant use are also helpful. Feedback from the users' perspective enables Public Works to monitor the "health" of a facility between scheduled inspections. Supplemental inspection input should be reviewed prior to the scheduled CI and appropriate information included in the CI Report. Control Inspection is the primary source of work generation. It should produce the majority of shop and contract maintenance and repair workload. AIS and budget base data is a natural by-product of effective CI.

2.3.1.1 Specialized Inspection. Specialized Inspections are investigations, tests or observations that require special skill or equipment. Specialized inspections include: Waterfront, Electrical Systems, Automated Control Systems, Elevators, Fleet Moorings, Roofing, Surfaced Areas/Airfield Pavements, Coatings/Composite Materials, Mechanical Systems, Underground Utilities, Petroleum Fuel Facilities, Trackage, Bridges/Trestles, Underground Structures, Corrosion Control/Cathodic Protection, Pest Management Programs, Antenna Towers. Inspections in general are performed by EFDs/EFAs on a reimbursable basis. Certain EFDsEFAs are tasked to provide specialized expertise and act as the "lead" in specific technical areas. The objectives of this are to:

- Develop and maintain recognized experts in specific areas.
- Concentrate on technical provisions and standards.

- Support activities, other EFDs/EFAs and **NAVFACENGCOM** in highly technical matters.

Specialized Inspections are part of Control Inspection for areas where special expertise is required, but unavailable. These inspections are normally conducted on facilities and equipment which impact safety or mission. They provide feeder information to the Control Inspector and indicate if detailed engineering investigations and designs are required.

2.3.1.2 Engineering Investigation. Engineering Investigations are one time highly technical studies requested by Control Inspectors based on a need. They may be conducted to determine the cause of a defect, extent of damage, ability of a facility to function, safety limitations, or condition of the facility or component. In addition, they may provide background information to supplement or support other programs and studies. A dialogue should be established between Engineering and FMED to review previous, current and proposed studies and other pertinent information.

2.3.2 Preventive Maintenance Inspection (PMI). PMI consists of examination, lubrication, minor adjustments and/or minor repair of dynamic equipment to which a specific operator is not assigned. The Work Generation Branch of the FMED determines what to inspect and the job specifications. The Shore Facilities Inspection (SFI) Module of Public Works Management Automation/Base Engineering Support, Technical (PWMA/BEST) will be helpful in facilitating the implementation and administration of a PMI Program. (See Chapter 8 for more information on PWMA/BEST.)

2.3.3 Operator Inspection. This includes examination, lubrication, and minor adjustments of equipment and systems for which the PWD is responsible and to which an operator is assigned. Safety and maintenance checks shall be included in Standard Operating Procedures (SOPs) and shall be conducted as listed in activity regulations and manufacturers' literature. Continuous observations shall be made when equipment is operating.

2.3.4 Certification Inspections. The intent of Certification Inspections is to ensure functional reliability and safety and to prevent property damage or personal injury. Certification of certain type facilities, components or sub-components is recommended and is sometimes mandatory. Elevators, Graving Drydocks, Crane and Railroad Trackage, Boilers and Unfired Pressure Vessels, Hyperbaric Facilities require certification. Information regarding certification requirements of these areas is in respective NAVFAC Maintenance and Operations (MO) Manuals or instructions. The Certification program is designed to identify and classify defects according to hazard or

risk. When prescribed limits are exceeded, the facility or component shall be placed out of service until repaired.

2.4 STANDARDS AND TECHNICAL ASSISTANCE. Technical information sources, standards, criteria and checklists for inspections are defined as follows:

2.4.1 Inspection Guides. Checklists, inspection points and other references include:

2.4.1.1 Control Inspection Checkpoints. MO-322, Volume 2 contains inspection checklists for Buildings, Mechanical/Electrical, Utility Plants and Distribution Systems and Miscellaneous Equipment, Structures and Systems. NAVFAC MO manuals covering maintenance, operations and inspection for a specific type facility are also available.

2.4.1.2 PMI Checkpoints. PMI checkpoints may be obtained from manufacturer's manuals, facility/equipment history files and NAVFAC MO manuals. Manufacturer's manuals for similar equipment may also be useful. Many new facilities may have Operation and Maintenance Support Information (OMSI) manuals of essential facility and equipment data. OMSI manuals may be a part of the construction contractor's delivery requirements. Warranty data is also included.

2.4.2 Maintenance Standards. The description of condition of plant and property must measurably relate to maintenance standards. Application of standards permit decisions on maintenance necessity, extent and frequency of maintenance, and effectiveness of the results of prior maintenance efforts. Application of standards permit comparison between conditions observed and the standard. The level of maintenance must be related to the Facilities Requirements Plan and the applicable Level of Maintenance Classification Code (Section 2.4.2.1.). For example, a warehouse in excess of requirement, or scheduled for removal within five years should not be maintained at the same level as one to be retained twenty-five years.

2.4.2.1 Level of Maintenance Classification (LMC) Codes. All facilities may not contribute equally to mission. Relating facility maintenance to mission, can result in more maintenance to facilities that are the most vital to mission. This can be don,: by assigning levels of maintenance classification (LMC) codes. The LMC code is not a priority system for work. Work on a Class C facility may be needed ahead of a Class A facility for safety reasons or protection of property. Parts of a single facility can also have different LMCs.

For example, some sections of roads or railroads serving an ammunition depot may be more vital to mission than other sections. Multi-classification may be justified for some facilities; however, it should be minimized. LMC codes for each facility should appear

on inspection records. Inspectors, Planner/Estimators, and Shop Supervisors should know its use and intent. Inspectors should relate deficiencies to LMC Codes when classifying deficiencies as Critical or Deferrable. It should also be used in work control to determine priorities for job accomplishment. LMC Codes are defined in Table 2-1.

Table 2-1
LEVEL OF MAINTENANCE CLASSIFICATION CODES
(LMC Codes)

Code	Classification Characteristics	Level of Maintenance
A	o Vital to mission o Active future of over 10 years	o Maintain economically to assure full safe and efficient support for an indefinite period
B	o Important to mission o Active future use of 3-10 years	o Maintain economically to fulfill mission for the duration of facility life or mission
C	o Limited importance to mission o Substandard construction or future active life of less than 3 years o Infrequently or only partially used	o Limited maintenance on basis of planned remaining useful life o Eliminate fire, health and safety hazards o Patch and reinforce instead of replacing wherever economical o Consider breakdown maintenance
D	o Inactive facilities (required during mobilization)	o Limited maintenance to assure weather tightness, structural stability, protection from fire or erosion o Eliminate safety or health hazards o Minimal maintenance to permit reactivation within the period prescribed under mobilization plans
E	o Surplus Facilities	o Eliminate fire, safety and health hazards o Prevent pilferage effecting final disposal action

2.4.2.2 Condition Evaluation Standards. Condition evaluation standards are prescribed ratings for various defect classifications. Condition evaluation ratings provide uniformity in assessing the condition of components or sub-components of a facility. Evaluation procedures may be standardized by assigning numerical ratings to specific conditions shown pictorially in respective condition evaluation standards handbooks. The concept behind a handbook is for inspectors with different backgrounds to be able to select the same rating from the handbook, thus providing a uniform rating system throughout the shore establishment. Facility condition standards are contained in selective MO manuals, such as, MO-102.1, MO-102.2, MO-102.3, MO-102.4, MO-102.6, MO-103.9 and MO-210.9.

2.4.2.3 Regulatory Standards and Safety Codes. Inspectors and Facility Managers should be familiar with these standards and know how they apply. These include:

- National Building Codes:
  - Corrosion
  - Electrical
  - Elevator
  - Plumbing
  - FRA Track Safety Standards
  - OSHA Requirements
- Design Criteria (Applicable to repair):
  - Design Manuals, NAVFAC DM Series and MIL-HDBKs
  - Industrial or Association Standards
  - Standard Engineering Texts and References
  - Military Standards
  - Type Specifications
- Environmental Regulations

2.4.3 Technical Sources. Sources of information include:

2.4.3.1 Manuals and New Technology. Inspectors should actively seek and be familiar with NAVFAC MO Manuals, especially in their craft areas, and with applicable technical manuals, NCEL Tech Data Bulletins, inspection guides, and manufacturer's instructions. A complete list of NAVFAC Manuals and Publications is included in NAVFAC P-349, "NAVFAC Documentation Index." Table 2-2 contains an excerpt listing of manuals with which Control Inspectors need to be familiar. Indepth guidance for such topics as corrosion control, surfaced areas and roofing are a few examples.

2.4.3.2 Technical Assistance. Inspectors should seek advice and assistance when needed or in doubt. Assistance is available from their supervisor, or Engineering Field Division/Engineering Field Activity (EFD/EFA), Public Works Centers and NCEL via the EFD/EFA.

2.4.3.3 Engineered Performance Standards (EPS). Industrial standards are rigidly defined for the exact performance of work throughout the production process where the work place is constant and method of work performance is carefully prepared. In maintenance, however, the same task may be performed at different times

Table 2-2
Selected Listing of Maintenance and Operations Manuals
(Source: NORTHNAVFACENGCOM Code 164 Data Base, October 1992)

Publication Number	Publication Date	Title
MO-102	3/1/77	Maintenance and Repair of Surfaced Areas (Tri-Service)
MO-102.1	11/1/88	Maint & Rpr of Asphalt Surfaced Airfields
MO-102.2	11/1/88	Maint & Rpr of Jointed Concrete Roads & Parking Lots
MO-102.3	6/1/89	Maint & Rpr of Asphalt Surfaced Airfields
MO-102.4	6/1/87	Maint & Rpr of Jointed Concrete Airfields
MO-102.6	5/1/90	Asphalt Crack Repair Field Manual
MO-103	1/1/80	Maintenance of Trackage
MO-104	10/1/87	Maintenance of Waterfront Facilities
MO-104.1	9/1/90	Maintenance of Fender Systems and Camels
MO-104.2	9/1/89	Specialized Underwater Waterfront Facilities Inspections
MO-110	6/1/81	Paints and Protective Coatings (Tri-Service)
MO-111	9/1/63	Building Maintenance; Structures
MO-113	1/1/74	Fac. Engineering Main. and Repair of Roofs (Tri-Service)
MIL-HDBK -1114/2	12/31/91	Maintenance & Operations of Heating Systems
MO-114 Vo1 3	2/1/89	Maintenance & Operations of Ventilation Systems
MO-116	3/1/72	Facilities Engineering; Electrical Interior Facilities
MO-117	9/1/89	Maintenance Fire Protection Systems
MO-118	10/1/88	Inspection of Vertical Transportation Equipment
MIL-HDBK -1119	8/31/91	Food Service Equipment
MO-124	8/1/87	Mooring Maintenance
MO-126	10/1/91	Inspection of Bridges and Trestles
MO-200	4/1/79	Facilities Engineering-Electrical Exterior Facilities
MO-201	4/1/90	Operation of Electric Power Distribution Systems
MO-204	5/1/74	Electric Power Systems Analysis
MO-205	6/1/64	Central Boiler Plants (Being updated as MIL-HDBK-1125)
MO-206	1/1/89	Operation and Maintenance of Air Compressor Plants
MO-207	12/1/75	Operation and Main. of Internal Combustion Engines
MO-209	1/1/89	Maintenance of Steam, Hot Water Distribution Systems
MO-210	8/30/84	M&O of Water Supply, Treatment & Distribution Systems
MO-210.9	8/1/90	Inspection of Elevated Water Tanks
MO-212	1/1/82	Sewage and Industrial Waste Disposal System
MO-213	5/1/90	Solid Waste Management
MO-220	11/1/70	Maintenance and Operation of Gas Systems (Tri-Service)

Table 2-2 (Continued)
Selected Listing of Maintenance and Operations Manuals
(Source: NORTHNAVFACENGCOM Code 164 Data Base, October 1992)

Publication Number	Publication Date	Title
MO-221	11/1/88	Utilities Metering
MO-225	8/1/90	Industrial Water Treatment
MO-230	8/1/90	Maintenance & Operation of Petroleum Fuel Facilities
MIL-HDBK -1130	12/31/91	Inactivation Caretaker Maintenance and Reactivation of Shore Facilities
MO-303	5/1/72	Utility Targets Manual (Being Updated)
MO-306	7/1/92	M&O Cathodic Protection Systems
MO-307	9/1/92	Corrosion Control
MO-310	12/1/71	Military Entomology Operational Handbook (Being Updated)
MO-312	5/1/90	Wood Protection
MO-312.1	2/1/91	Inspection, Maintenance, Procurement Procedures for CDAA Wood Components Handbook
MO-312.2	4/1/91	Field Guide for Receipt & Inspection of Treated Wood Products
MO-312.3	9/1/92	Insp., Maint, and Procure. Procedures for Wood Poles
MO-312.4	3/1/92	Wood Protection Instructor's Training Manual
MO-314	5/24/89	Weed Control and Plant Growth Regulation
MO-315	10/1/91	Pest Control Quality Assurance Evaluator Handbook
MO-321	9/1/85	Facilities Management
MO-323	4/1/86	Inspection, Main., & Operations Manual for Naval Reserve Centers (NRC) (Being updated as MIL-HDBK- 1151)
MO-324	3/1/92	Inspection & Certification of Boilers & Unfired Pressure Vessels
MO-327	6/1/90	Facility Support Contract Quality Mgmt Manual
MO-330	8/17/87	Materials Testing
MO-340	7/1/80	Ship to Shore Hose Handling Operations Manual
MO-350	12/1/79	Standards Operational Manual For Waste Oil Raft
MO-405	7/1/90	Maint. and Operation of Active Solar Energy Systems
MO-406	7/1/90	Maintenance of Hyperbaric Facilities
MO-909	8/1/79	Oil Shop Off Load Barge (SWOB)
MO-910	7/1/81	Sewage Ship Waste Off Load Barge (SWOB)
MO-911	8/1/90	Utilization of Navy Generated Waste Oils as Burner Fuel
MO-913	9/1/91	Historic Structures Preservation Manual

to obtain identical results, but rarely is the method of work performance identical in all respects. Work sites, tools, materials and methods may vary between two performances of the task. Engineered Performance Standards are developed by observing maintenance personnel at work and by measuring their work through the application of approved Industrial Engineering techniques. This provides the Planner and Estimator and shops with estimating standards that truly represent the specific type of work (maintenance) to be done. Time standards for many maintenance and repair tasks are available in the NAVFAC P-700 Manual (series), "Engineered Performance Standards." These standards are also incorporated in the Facilities Engineering Job Estimating (FEJE) module of BEST. Application of EPS is facilitated by use of the BEST Automation Tool.

2.5 FORMS AND RECORDS. Only forms needed to effectively manage the Shore Facilities Inspection/Assessment System should be used. Records must permit appraisal of the planning and execution of the inspection effort; preparation of required reports; identification of future funding requirements; and maintenance of accurate historical data. Specific reports, forms and records are discussed in Chapter 4, Control Inspection Reports and Records and Chapter 5, Preventive Maintenance Inspection/Service (PMI) Procedures.

2.6 RELATED PROGRAMS AND AGREEMENTS. Specific agreements and programs are an important part of the Inspection/Assessment System. They are:

2.6.1 Maintenance Service Agreements (MSA). Formal agreements for recurring services on specific equipment and facilities. The scope of work must be defined in a written specification and the work quality and quantity specified in a contractual-like agreement between the customer and Public Works. MSA's are used primarily by PWC's. MSA's should be reviewed, renegotiated and updated annually. Basic elements of the agreement are:

- **Level of Maintenance. The** level to which equipment or facilities are to be maintained.
- **Unplanned Corrective Maintenance.** Provisions for a breakdown or malfunction requiring unscheduled service.
- **Planned Corrective Maintenance or PMI.** A scheduled shutdown of equipment for planned maintenance or cyclic checks, adjustments, and service to keep equipment at a prescribed level of operating performance.
- **Planner/Estimator Inspection.** Provisions for on-site evaluation of work to finalize the job plan and estimate.
- **Quality Assurance Evaluation (QAE).** Ongoing evaluation of work (by shop supervision, and/or full-time Quality Control Technicians) to assess quality and quantity of work performed.

2.6.2 Intra/Inter-Services Support Agreements (ISSA). Formal Agreements to provide support in a contractual-like manner by or between DOD components or another federal agency/department. Intra denotes agreements between Navy components, Inter denotes external Navy sources. The content of ISSAs should address the same basic elements as MSA, as a minimum.

2.6.3 Engineering Evaluation (EE) of Existing Assets. Engineering Evaluation is part of the Shore Facilities Planning System (SFPS) and is described in the "Shore Facilities Planning Manual", NAVFACINST 11010.44 (series). SFPS planners rely on information provided by on-site inspections, Control Inspection Reports, AIS, engineering investigations, and other technical studies. To assure high quality Shore Facilities Planning documentation, Planner/Estimators and/or Control Inspectors should be assigned to assist EFD planners in on-site, visual inspections. Control Inspector backgrounds and experience provide invaluable assistance to planners by:

- Identifying undocumented facility use/users.
- Defining user and host-tenant relationships.
- Indicating adequacy of facilities for current use.
- Determining siting adequacy for current use based on safety criteria.
- Evaluating suitability of facilities for other uses.
- Assessing facility condition (functional and physical) and citing major deficiencies.

2.6.4 Family Housing Programs. Family Housing inspections include:

- **Maintenance and Repair Inspection Program (MARIP).** Its purpose is to identify family housing maintenance and repair deficiencies. Program responsibility lies with the EFD's Housing Division. Direction is established in NAVFACINST 11101.94 (series).
- **Occupancy Inspection Program (OIP). The** program includes four vital inspections: make-ready, check-in, pre-termination, and termination. They identify Command and occupant responsibilities, determine condition of quarters, initiate good occupant relations, orient and instruct the occupant on equipment operation, and ensure occupants understand

procedures for obtaining Emergency/Service. This program is discussed in the Navy Family Housing Manual, NAVFAC P-930.

CHAPTER 3. CONTROL INSPECTION PROCEDURES

3.1 PURPOSE. The purpose of Control Inspection is to conduct a complete visual inspection of all facility components, items and systems to determine physical condition. The inspector shall address the need for repair, replacement versus repair of selected items, or replacement in total. The Inspector's Report is the single most important document in the process and is the inspectors "only" product. The inspector is the direct link between the facility's health and the funding process. The Inspection Report must answer:

- What is wrong (description & scope)?
- Where is the problem (location)?
- How big is the problem (quantity)?
- How to correct the problem (solution)?
- How much does it cost to fix ($)?
- Who should fix it (craft/contract)?
- When should it be fixed (priority)?

3.2 OBJECTIVES. Control Inspection is a scheduled facility inspection designed to:

- Provide a thorough examination of each facility and its components and make uniform assessment of condition.
- Appraise the adequacy of Operator and Preventive Maintenance Inspections.
- Assure adequate, consistent levels of maintenance by detecting over or under maintenance.
- Minimize system breakdowns and repair costs.
- Regulate the input of work for PW shops or contract.
- Provide AIS/BASEREP reporting data.

- Identify facility maintenance and repair resource requirements and provide a basis for developing a meaningful, executable resource plan.

3.3 INSPECTOR QUALIFICATIONS. Inspectors should have a technical trade background in electrical, mechanical or structural disciplines. Formal education in theory is desirable. They should have the ability to write clear, concise, detailed descriptive reports of facility condition. They need to be experienced in maintenance and repair operations and skilled in inspection techniques, planning and estimating, maintenance standards, safety, health and building codes. It is usually cost effective for inspectors at small activities to possess a craftsman rate in one discipline with experience and/or knowledge of the others. Working knowledge may be obtained from on-site training, EFD/EFA or PWC training, correspondence courses, or instruction from schools or industrial facilities. A basic understanding of micro computers and the ability to become proficient in their use is recommended. Training and experience requirements are contained in Office of Personnel Management Standards. Basic Control Inspection Program Training can be attained by completing two-phased training offered by EFDs/EFAs: Phase 1 (Control Inspector Training) and NTTC-160 Correspondence course (Phase II) available from NAVFAC Code 161,8530 La Mesa Boulevard, La Mesa, CA 92041. Control Inspection can be performed by engineers, Inspection Branch or contractor personnel.

3.4 SCHEDULING CONTROL INSPECTIONS. Control Inspection workload should be balanced with available capability and scheduled annually. This provides the most effective method of identifying and processing deficiencies. Facility inspection scheduling documentation should be administered and maintained by the Work Generation Branch. Where PWMA/BEST is installed, the Shore Facilities Inspection (SFI) module can perform this function (see Chapter 8).

3.4.1 Frequencies. Recommended Control Inspection frequencies are contained in Appendix B. Available resources may not permit inspecting at this frequency; however, the frequencies in Appendix B have been established by CNO as a baseline for consistent reporting purposes and as a desirable Navy goal. Activity Inspection frequencies must, however, be based on available resources, facility mission, experience and engineering judgment.

3.4.2 Scheduling Considerations. When developing inspection schedules, certain variables to consider are:

- Activity resources available for Control Inspection.
- Time for each discipline to inspect a facility (See Section 3.4.3).
- Team size. When possible, Inspection teams should be formed. Teams offer complementary experience and training, provide safety backup and maximize transportation utilization. This permits technical discussions

for problem resolution and insures the presence of another person during the inspection of attics, crawl spaces, roofs and fire escapes. Facilities requiring only a single discipline can be used to smooth resource "peaks" and "valleys" in the scheduling process.

- Climatic conditions (rainy season, severe winters, dry season, storm season, and tides) impact planned scheduling. Extra inspections may be necessary after storms.
- Special requirements such as special equipment, tools, security clearance, etc.
- Inadequate Inspection Resources. If all facilities cannot be inspected at the CNO recommended frequency (Appendix B), an alternative plan is needed. One alternative is to use the LMC as the basis for scheduling by grouping facilities into 3 categories: Group 1 containing LMC "A", Group 2 containing LMC "B", and Group 3 containing LMC "C", "D" and "E", i.e., mission essential, mission support and non-mission related. Depending on resources available, inspect all Group 1, 1/2 of Group 2 and 1/3 of the Group 3 facilities each year. Note - AIS facility inspection status must still be reported based on CNO baseline standards (Appendix B) and not alternative frequencies.
- Overtime.
- Utilizing an A&E contractor or PWC to inspect all or selected facilities.
- Augmenting the Inspection force with qualified shop personnel on a temporary basis.

A key to successful scheduling execution is to send a memo to the Facility occupant advising of the scheduled inspection and requesting their input prior to the actual visit. The memo may contain space for feedback of their problems and experiences for analysis beforehand.

3.4.3 Control Inspection Times. Inspection time is the amount of time normally required to examine the facility with appropriate tools or equipment. Appendix C provides inspection time guides to help prepare initial schedules. Time must be added to make sketches, report writing, cost estimating, travel and delay time. It is important to give inspectors adequate time to make careful inspections. Intangible factors that may affect inspection time allocation are: inspector undergoing on-the-job training, scope of deficiencies, age of facility, type of construction, and site conditions. Initial inspections will generally require more time because the size and scope of deficiencies found are usually greater. Recording actual inspection time is critical to the success of future schedule development. Time spent on inspection preparation, on-site inspection, travel and report writing should be recorded separately. After a series of inspections

has been made, better time values are available for adjusting schedules. Activities using PWMA/BEST may use the SFI module to generate and refine inspection times.

3.5 PREPARING TO INSPECT Prior to on-site inspection the inspector should analyze work control files including E/S files to determine if major deficiencies exist or are developing. The status of work planned or in progress should be considered and addressed in the Inspection Report. Work on the current shop load plan should be included on the Inspection Report and noted that Job Order "X" will correct a specific deficiency. New deficiencies with a significant impact on currently planned or authorized work should be noted on the Inspection Report and brought to management's attention. This allows management to modify job orders thus reducing or preventing costly delays during work accomplishment. Jobs on the Shop Load Plan should be modified to include correction of appropriate newly discovered deficiencies, if prudent. Review of E/S work can reveal potential problems or highlight intermittent, cyclic or seasonal occurrences. Additional items that should be included on the inspection planning and preparation checklist are to:

- Be familiar with Activity's Master Plan for Facility use and general development.
- Obtain facility floor plans.
- Obtain listings, status and appropriate documentation for major alteration and maintenance projects.
- Determine craft codes and labor rates.
- Determine maintenance cycles with respect to painting schedules, long-range maintenance plans, etc.
- Obtain a list of pertinent contracts and warranties.
- Obtain lists of building tenants and maintenance persons.
- Establish Facility priority (LMC).
- Arrange security clearance for the inspection.
- Determine special safety precautions that must be observed: radioactivity, asbestos, confined spaces air sampling, hard hat/safety glasses/safety shoe requirements, weak roof areas, inspector physical exams, etc.
- Resolve any interference with other inspections or audits scheduled for accomplishment: energy audit, asbestos, roofs, security or fire protection.
- Determine special tool and test equipment requirements, and define the depth of diagnostics intended during the conduct of the inspection.
- Notify the building manager/user of the planned inspection and request preliminary user feedback of known trouble areas.

3.6 ADDITIONAL DUTIES OF MECHANICAL AND ELECTRICAL INSPECTORS. Mechanical and Electrical Control Inspectors must monitor PMI program effectiveness and recommend changes where needed. To do this, they must be familiar with the scope and frequencies of Preventive Maintenance Inspections. Inspectors should also be involved in review of PMI feedback reports and E/S analysis. There is seldom need for structural PMI.

3.7 CORRECTING NON-DEFERRABLE (CRITICAL) AND DEFERRABLE DEFICIENCIES. A deficiency is considered to be Critical if: (1) it must be corrected within 12 months and (2) it will impact mission, affects quality of life or has safety or environmental hazard potential. Deficiencies not meeting these two (2) criteria (time and type) are Deferrable. A critical deficiency that has existed for more than four (4) years is to be classified as deferrable. Processing and programming deficiencies for correction is a Work Generation Branch function within the FME Division. This requires FME Division Management to ensure that:

- The deficiency scope and year of correction be defined.
- The deficiency be included in a maintenance action plan. If it is Special Project scope, it should be submitted to the major claimant for programming or in the case of NIF activities, approved for inclusion in the NIF overhead budget for recapture.

NOTE: Activities utilizing the PWMA/BEST Work Input Control (WIC) module can track deficiencies from inception to Facility history files.

3.8 CONTRACTOR ASSISTANCE. An activity may determine that contractor assistance is required for Control Inspections. They can examine facilities/systems to determine physical condition and provide reports identifying deficiencies and estimated costs. In addition, they can develop Step I Special Project documentation for deficiencies exceeding the Commanding Officer's funding authority. Input of deficiency data (as job packages) into the activity's ADP system can also be made part of the contractor's responsibility.

Assistance in obtaining contractor support is available by submitting an Engineering Services Request (ESR) to the EFD/EFA, The EFD/EFA will prepare an Engineering Services contract for award to a qualified A-E firm. Pre-negotiation and on-site "kickoff" meetings with EFD/EFA, activity, and contractor personnel is an essential step. They ensure all parties understand contract requirements and quality of expected products. To help ensure a successful product, activity involvement throughout the contract is essential. Initially, the activity should provide the contractor with facilities and location maps, units of measure, Facility History Files, drawings, and Service Call history. The activity should randomly conduct comparison inspections to ensure "product satisfaction." Specification packages are available from NAVFAC EFDs/EFAs to assure a

quality product is received and the contract is properly administered.

There are advantages and disadvantages to contractor inspections. Advantages include:

- Obtaining a one-time comprehensive inspection to supplement in-house effort.
- A more liberal approach and identification of long-range Special Project scope repairs.
- Obtaining an outsider's view of facility conditions and incorporation of repair by replacement philosophy vice the potential for a "scrape, patch and paint" approach.

Disadvantages include:

- Lengthy contract processing time.
- Assigning work tasks to administer and monitor the contract.
- Dependency on contractor inspections for AIS data.
- Abandoning the Control Inspection Program as a means to generate work on a continuous basis for shop/contract accomplishment.
- Loss of corporate facility knowledge and familiarity.
- Public Works/Customer relationships may suffer as a result of less frequent interface.
- The volume of one-time inspection data is often overwhelming causing the product to not be properly used.
- Delegation of responsibility for classifying deficiencies as Critical or Deferrable to the contractor.
- The expense of contractor assistance is normally three to five times in-house cost.
- Difficulty of monitoring thoroughness of crawl space and attic inspections.

An alternative to total contract inspection is contract inspection of selected facilities with remaining inspections done in-house. This enables the activity to select mission essential and/or facilities which are difficult to inspect for contract inspection thus ensuring comprehensive coverage overall. Examples might be: infra-red inspection of electrical panels; infra-red roof inspection by aircraft.

Contract inspection should be viewed as an alternative only if there is insufficient in-house inspection personnel or expertise is limited in certain areas.

CHAPTER 4. CONTROL INSPECTION REPORTS AND RECORDS

4.1 REPORT DESCRIPTIONS. The Control Inspection Report Package consists of: A "Facility Condition Summary Report" and a "Facility Condition Report Detailed Deficiency List." The Report package enables Inspectors to systematically report deficiencies, urgency, and provide preliminary labor hour and material estimates by trade. The Report identifies "packages of work" that can be planned, estimated, and programmed into a work control system as a single undertaking. It can also be used to provide budget-oriented resource requirements data and is the basis for the Annual Inspection Summary (AIS) and BASEREP assessment. Priorities assigned by Inspectors highlight urgent items requiring immediate correction differentiating from long-range requirements for maintenance planning purposes. A "Facility Inspection Checklist" may also be added to the Report package to reflect facility components examined and not examined during the Inspection. Figures 4-1, 4-2 and 4-3 portray the CI Report package documents and format.

4.1.1 Facility Inspection Checklist. The cover sheet of the completed Inspection Report package may be a "Facility Inspection Checklist," Appendix D. It tells management at a glance what facility components were inspected (structurally, electrically, mechanically) and if it received a roof inspection. It lists items to be inspected. Its use ensures all major items in a facility are considered by the Inspector and provides a summary of what was inspected. Figure 4-1 portrays a typical checklist.

4.1.2 Facility Condition Summary Report Sheet. The "Facility Condition Summary Report," Figure 4-2, provides a summary of labor hours and cost by craft and material or contract necessary to restore the facility to an acceptable condition. Management can quickly view craft areas involved for workload programming and cost of restoration for budget and operating plan purposes.

4.1.3 Facility Condition Report Detailed Deficiency List. The "Facility Condition Report Detailed Deficiency List," Figure 4-3, provides information necessary for day-to-day management, i.e., what is wrong, cost of correction and urgency. Management should immediately evaluate each item checked "Immediate" or in the "One-Year" columns and plan or initiate corrective action. Deficiencies remaining unfunded on 30 September comprise the activity's Critical Maintenance and Repair backlog on the AIS. Deficiencies checked in the "Two Years and Beyond" column provide a relative degree of urgency and are included on the AIS backlog as Deferrable Maintenance and Repair

items. The value of the detailed deficiency listing of deficiencies is further enhanced when accompanied by afloor plan (Figure 4-4) coded to denote the exact location of

DATE: _____

FACILITY INSPECTION CHECKLIST

FACILITY NUMBER: _____ REPORT NO: _____

INSPECTOR(S): _____ INSP. HOURS: _____

_____

ENTER: (S) = SATISFACTORY or (U) = UNSATISFACTORY

ELECTRICAL		MECHANICAL	
INCOMING SERVICE		PLUMBLING	
MAIN DISTRIBUTION PANELS		HEATING	
POWER/LIGHTING PANELS		COOLING	
ELECTRICAL DEVICES		EXHAUST/VENTILATION	
ELECT. WIRING NETWORK		TEMPERATURE CONTROLS	
_____		_____	
_____		_____	

EXTERIOR		INTERIOR	
ROOF		FLOORS	
WALLS		WALLS	
FOUNDATON		CEILINGS	
WINDOWS		DOORS	
GENERAL		STAIRWAYS	
_____		_____	
_____		_____	

SAFETY/HEALTH		SITE	
EMERGENCY LIGHTS		SIDEWALKS	
EXIT LIGHTS		AREAWAYS	
DETECTION DEVICES.		DRAINAGE	
PROTECTION SYSTEMS		ROADS	
WATER TREATMENT		PARKING LOTS	
SEWAGE TREATMENT		_____	
FOOD SERVICE		_____	
_____		_____	
_____		_____	

NOTES:

_____

_____

_____

_____

_____

Figure 4-1
Facility Inspection Checklist

WIC/INSPECTION SUMMARY

SHORT DESCRIPTION: _____

PW NUMBER	FACILITY	DC	FUND SOURCE
		1 2	

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E M Q S D	M R A I	1 2 3

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	Y N	MT RP DM DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
EL ME ST PT RF OT SP		C M S V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST

COMMENTS:

ES CALLS REQUIRED Y N

Figure 4-2
Facility Condition Summary Report

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTINGS

Page ___ of ___

Date _____

Inspection Time _____

Facility Number _____

Type Inspection: S E M O

Inspector _____

PKG	E	1	2	3	4	5	DEFICIENCY DESCRIPTION	W/C	LAB HRS.	LAB COST	MATL COST	TOTAL COST

Figure 4-3
Facility Condition Report Detailed Deficiency List

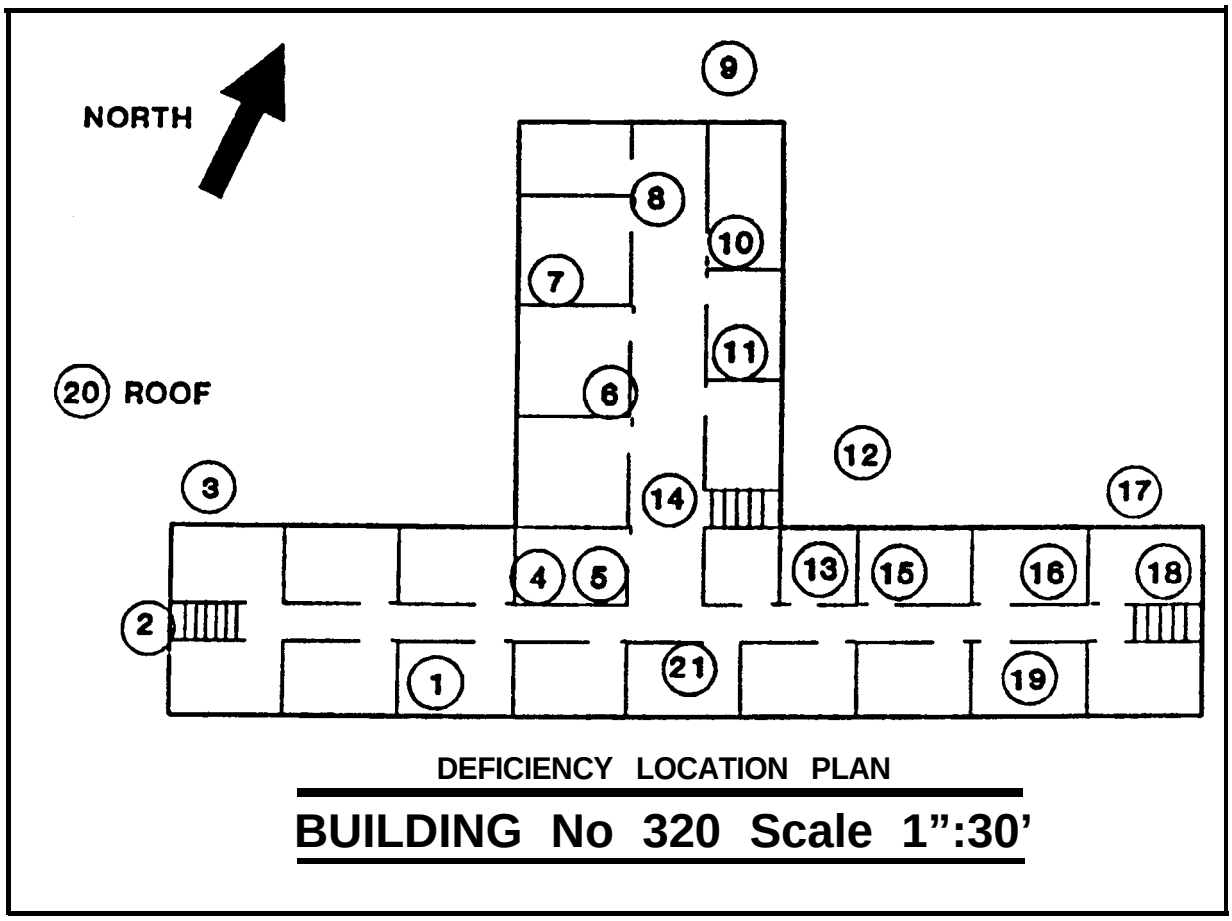


Figure 4-4
Facility Condition Report - Coded Floor Plan

reported deficiencies within the Facility.

4.2 REPORT PREPARATION. A complete Facility Condition Report package is comprised of three (3) essential documents. These documents reflect the results of inspections for structural, electrical, mechanical and roofing disciplines. Most facilities require all four (4) disciplines. A complete Inspection Report package will include individual "Facility Condition Detailed Deficiency List" and "Facility Inspection Checklists" for each facility accompanied by a "Facility Condition Summary Sheet." The Detailed Deficiency List depicts findings by discipline. The Summary sheet combines all disciplines depicting overall condition and craft area workload on a single sheet of paper. Floor plans, etc. may be attached as part of the package. The Detailed Deficiency List form may also be used to report PMI work that is beyond the scope of the PMI work authorization. These reports are made a part of the Facility File.

Facility Files should contain complete data on all facility deficiencies. It is the central reference point for all Inspection Reports, customer Work Requests, and Emergency/ Service work authorizations.

4.2.1 Preparation of "Detailed Deficiency List". The Inspection Report is the key to the Shore Facilities Inspection/Assessment System. Incomplete, inaccurate reports result in confusion, extra paper work, avoidable cost, and may endanger life and property. Inspectors should be instructed in inspection report preparation. Inspectors should describe deficiencies on the "Detailed Deficiency List" (Figure 4-3). Attempt to record the true cause of a problem. A separate sketch may describe work more clearly and be attached as a supplement. Inspectors should concisely describe each deficiency and recommend corrective action. Inspectors shall designate each deficiency as Deferrable or Critical using guidelines in OPNAVINST 11010.34. They should prepare a preliminary cost estimate (labor and material or contract costs) to correct each deficiency (see paragraph 4.2.4). Although Control Inspectors generally do not make adjustments to equipment, it is permissible at small activities if Inspectors are qualified and authorized. The report should contain enough detail to enable a job order to be written without revisiting the job site. Inspectors should ask these questions before releasing the report: (1) Could a final estimate for labor and material costs be made from my description? (2) Is there enough information for FMED personnel to make intelligent decisions concerning priorities and funding? (3) Could the deficiency be corrected from the information on my report? The report form is designed for deficiencies of Specific Work scope; however, Emergency/Service and Minor Work deficiencies can also be recorded and processed. Inspection reports will reflect three types of findings:

- **New finds.** Original, first time deficiencies not previously documented.
- **Known deficiencies.** A known problem that has not been corrected. The cost estimate and scope of work may require revision because of deterioration (or partial correction of the problem).
- **No deficiency finds.** This should be recorded and kept on file.

4.2.1.1 Report Accuracy. Thorough reporting is important. Inspectors sometimes ask: "Why keep reporting the same deficiencies? They never get corrected." There will never be resources to correct everything so deficiencies will continue to exist. In fact, they will get worse due to deterioration and Deferrable deficiencies will, eventually, become Critical. Thorough reporting is essential, especially during austere times, because:

- Scope and cost requirements must be updated. This is needed in the budget process. It provides justification for the current level of funding and is the only hope for increasing funding.
- Routine updating and comparative analysis permits an accurate annual facility condition assessment. This is also a factor considered in higher level resource decisions.
- Complete reporting enables management to intelligently prioritize all work, giving consideration to deficiencies which migrate from Deferrable to Critical.

- It provides information for a continuing review of workload with respect to in-house/contract decisions.
- Updating of scope and costs for Special Projects helps the claimant reevaluate project priorities.

As a minimum, each deficiency reported should:

- Reflect a correction action verb - repair, replace, prepare, etc.
- Define the problem - leaking valve, broken switch plate.
- Location - exact - Bldg. E, Room 307, South wall.
- Quantify costs - + 25% accuracy for budget and planning purposes.
- Be noted on a floor plan - shops must be able to easily locate.

4.2.2 Work Packaging. Work identified by inspection is used for AIS, budget, contract and shop loading decisions. It can fill these roles best, however, when it can be viewed in the way it will eventually be authorized for accomplishment. Work packaging is a technique that "packages" deficiencies together the way it makes sense to do the job. This should be done by the inspector at the time of report preparation. The inspector should ask which deficiencies should logically be worked together as a single undertaking and then group those items on the Inspection Report. The letters A, B, C, etc. on the left side of the Inspection Report can denote items that can be worked together. Note the blocks on Figure 4-3. The package should then be assigned a Work Request (P.W.) number and entered in the Work Control Program or Work Input Control (WIC) module. A breakdown by Work Center should be shown in the Work Center Summary Section of WIC. Summarization into packages can reduce the number of entries in a manual or automated system by 40-60 percent. This technique is illustrated in Appendix E. This appendix also provides a sample input for a Public Works Management Automation (PWMA), BEST, WIC Module data entry.

4.2.3 Inspection Report Numbering. Each Detailed Deficiency List or Work package should be numbered. The number should be shown on all Job Orders correcting a deficiency. One system consisting of four components which can be used for Inspection Report Numbering is:

_____	_____	_____	_____
Bldg. No.	Month	Year (last digit)	Discipline (M,E,S,R)

Example: Bldg. 320; Mechanical Inspection for the facility conducted in April of 1992.

Detailed Deficiency List number:	320-4-2-M
Summary Sheet and Checklist number:	320-4-2

4.2.4 Deficiency Cost Estimates. Inspectors will prepare only preliminary cost estimates. NAVFAC P-716, "Unit Price Standards" (UPS), MEANS, Richardson Dodge, etc. are recommended as useful tools. Estimates should show labor and material by craft regardless of whether the work will be done in-house or by contract. Final estimates with material take offs may be generated for deficiencies designated as critical only if they will be funded and worked within 12 months. Inspectors should not recommend the method of work accomplishment, e.g., PWD or contract forces (unless obvious). Costs may be adjusted if a decision to contract is made. Cost data must be provided for all deficiencies. If information is incorrect or missing, reports generated from deficiency data will not be accurate.

4.2.5 Special Projects Program. Special projects are work which is beyond the Commanding Officer's approval authority. OPNAVINST 11010.20 series provides guidance. Control Inspectors should be the primary source of input for the Special Projects Program. If a Special Project requirement is identified, inspectors should:

- Prepare a scoping estimate (see paragraph 4.2.4).
- Annotate the item as a potential Special Project to alert management.
- Forward the Inspection Report to Engineering/Planning via the FMED for evaluation and preparation of project documentation.

It is critical that Engineering personnel perform an on-site validation of the Special Projects technical requirement, scope, cost and ensure inclusion of all major related work required for that facility. This validation process prevents overloading shops with project scope work, permits economies of construction and causes minimum disruption to facility occupants. Phased projects should be considered if the total cost is too high for funding in a single year or if operational constraints prohibit single year funding. Total project requirement (scope) should be identified to the claimant with phased work accomplished by several contracts. Activities should take full advantage of claimant funding to correct major deficiencies that would deplete activity resources. To enable proper claimant programming, Special Projects should be prepared and submitted throughout the year as inspections are completed and requirements identified.

4.2.6 Inspection Report Use. The inspection and subsequent report are a waste of resources if management fails to use the product to effectively manage facilities. The number of ways the product can be used is limited only by the imagination and initiative of management. In addition to the routine uses as a shop/contract loading, budget and AIS tool there are other "spin-offs" of data that can assist the manager in decision making. A few examples are craft summaries (staffing); backlog reduction plans;

Facility Condition Index by facility, cost account or investment category; priority listing by facility, customer, etc; type deficiency (roofing/paint) listing; condition assessment by facility age; etc. The FMED Director, or designee, shall review, coordinate and process all Inspection Reports. If funding is not available, deficiencies should be placed in backlog as a valid critical or deferrable requirement. If it is more important than a planned and funded job, it should be processed and the less important item relegated to backlog status. A Control Inspection Report flow is shown in Figure 4-5.

4.3 TYPES OF RECORDS. An effective inspection records system, whether manual or automated, consists of:

4.3.1 Facility History Files. A current Inspection Report should be on file for each facility. The Facility History Files should include copies of work in process and completed work. Accurate facility history is critical to the decision making process involving economics of repair, repair versus replacement, effectiveness of maintenance methods, techniques, etc. Figure 4-6 shows an example of Historical Records for built-up and asphalt-shingled roofs. Other examples may be found in literature from trade groups or other NAVFAC MO Manuals. Accurate Historical Records are also the best means of gathering data to arrive at a meaningful evaluation of completed jobs to determine methods of improvement or cost reduction on future jobs. These records should be used to:

- Determine product effectiveness under varying environments or on different surfaces.
- Compare different products under similar conditions.
- Compare different equipment for product application.
- Determine labor efficiency under varying conditions.
- Judge better (or lower) quality products on planned jobs.
- Better determine frequency of application of a product.

The proper use of Historical Records replaces guesswork with purposeful direction and planning. Goals can be established realistically and with confidence based on recorded experience. The ultimate result is a refined maintenance program which provides an economical and efficient means of prolonging facility life and protecting investments.

4.3.1.1 Warranty Program. This program is vital to a cost conscious organization, especially one under a Station Operations and Maintenance Contract. It is easy to have work covered by warranty erroneously accomplished by another means. This is minimized if warranties are recorded and work monitored and tracked to avoid in-house accomplishment. The success of this program is directly related to feedback from Contract Surveillance personnel (for a contract operation). It also helps manage-

CONTROL INSPECTION FUNCTION

1. Review previous inspection report from Facility File

2. Review pending/completed work requests

3. Note programmed work from Shop Load plan6

4. Review work included in contract6

5. Check Special Projects funding status

6. Inspect facilities as scheduled

7. Conduct a complete inspection

8. Obtain a Control Inspection number for each report

9. Consult with Work Reception Section personnel to expedite issuance of Emergency/Service chits for items requiring urgent repairs under 16 hours. Record E/S chit number on the Inspection Report and vice versa

10. Prepare a comprehensive Inspection Report

11. Forward the completed Report with cover sheet to the Facility Management Engineering Division Director

FACILITY MANAGEMENT ENGINEERING DIVISION DIRECTOR

1. Receive Inspection Report

2. Review each item with respect to the:
   (a) criticality of each deficiency
   (b) Level of Maintenance Classification for the facility
   (c) funds and shop capability

3. Make an initial decision on each item with respect to:
   (a) whether the item should be programmed, and if so, the desired month
   (b) whether the item should be deferred or contracted
   NOTE: The Inspection Report provides space for noting nondeferrability

4. Make appropriate additions/ deletions to Maintenance Action Plan

5. Forward the Inspection Report and annotated cover sheet to the Work reception Section

WORK RECEPTION SECTION (WORK PROGRAMMER)

1. Receive Inspection Report and cover sheet with instruction6

2. Note instructions of FMED regarding item by item disposition as depicted on the cover sheet

3. Prepare tab strips in accordance with instruction6 and post to the appropriate Shop Load Plan (short, long range), contract board or suspense file or input into Best/PWMA systems, if installed

4. update the work center labor hour totals as well as financial commitments

5. Advise the FMED when a month has been over-programmed and adjust the Plan in accordance with instructions

6. Post the job order number to the tab strip when the job order has been prepared. Insure that the Inspection Report number is noted on every applicable job order

7. Insure that previous Inspection Reports of the same facility do not contain the same deficiencies to avoid duplication of total requirements

8. File the annotated inspection Report in the Facility File

NOTE:

1. All Inspection Reports must be numbered for identifying the Report and facility.
2. Unscheduled inspections should be conducted only when unavoidable. These inspections disrupt the Control Inspection program and often duplicate work previously disclosed by a Control Inspection. To avoid duplication, the inspector should always review the Facility Pile prior to conducting inspection.

Figure 4-5
Control Inspection Report Flow

HISTORICAL RECORD-BUILT-UP ROOFS

BUILDING NO. 1 USED FOR Reserve Activities
Permanent X Semi-permanent ____ Temporary ____ Year Roof was Applied 1980
Slope of Roof: Flat _____ In. per foot 1'in 20
Area of Roof: Squares 122 (one square equals 100 sq ft)
Roof Deck (Type, thickness or gauge, coating or treatments, method of attachment, side lap fastening, lap requirements, span, etc.):
Wood _____ Concrete slab _____ Concrete plank _____
Gypsum slab _____ Gypsum plank _____ Steel X Other _____
Additional information: _____

Type of Built-Up Roof:
Asphalt: Aggregate Surfaced X Smooth Surfaced _____ Cold Process _____
Coal-Tar Pitch _____
Kind of Surfacing: Slag _____ Gravel X Crushed Stone _____
Promenade tile _____ Slate slabs _____ Mineral-surfaced cap sheet _____
Smooth-Surfaced cap sheet _____ Other surfacing (name) _____

Number of Plies of Felt: 2 ____ 3 X 4 ____ 5 ____
Kind of Felt: Organic (Rag) X Coated ____ Uncoated _____
Glass Fiber _____ Asbestos ____ Coated ____
Uncoated ____
Kind of Base Sheet: _____
Insulation (List all trade names, thickness and type of each layer, define published 'R' values, method of attachment to substrate and layer to layer. Identify code numbers, U.D. or F.M. labels, method of breaking joints, etc.):
Composite
2" Urethane R-14
1" Mineral Board R-2.8

Vapor Barrier (When used, identify trade names, mil thickness, how sealed at ends and side laps, penetrations, describe quantity of adhesive and method of application. Describe edge seals if used.):
None

Flashings (Describe base flashing materials such as cant strips, types of films or felts used, priming of walls, trade names and description or thickness, specified fasteners and frequency, surfacing, list flashing spec numbers and manufacturer's details):
Base flashings: Metal _____ Kind of metal _____
Composition 376 LF Kind Felt
Cant strip: Yes X No _____
Other (describe) _____
Counter or cap flashings: Yes X No _____
Through wall: Yes _____ No X Metal _____
Kind of metal Galv. Composition _____ Kind Painted
Other (describe) Wall 156 LF Felt
Reglet (describe) _____
Additional information: Edge Metal 155 LF Galv Counter 48 LF Galv

Figure 4-6
Historical Record Build-Up Roof

HISTORICAL RECORD - BUILT-UP ROOFS

Drainage System: (include use of crickets, scuppers, drains set in sumps, etc):

Roof drains: 3"

Scuppers:

Gutters: 153 LF Galv

Downspouts: 90 LF Galv

Other: Slope East to West

Previous Maintenance: (Describe briefly with dates; attach additional sheets if necessary):

Roof membrane:

Flashings:

Weather conditions: (Weather during installion)

Guarantees:

Roof Guarantees by: ABC Company

Expiration Date: 4/1990

Additional Information:

Contacts:

	FIRM	CONTRACT	TELEPHONE
Architect		79-C-11XX	
General Contractor		79-C-01XX	
Roofing Contractor			
Roof Consultant			
Test Laboratory			
Roofing Mat'ls. Manufacturer	ABC Company		
Deck Contractor			
Decking Mat'ls. Manufacturer			

Others

1 Curb Mounted Rooftop HVAC Unit

2 Pitch Pans (ELEC)

3 Exhaust Vents Galv/Paint

4 Plumbing Vents Flashed w/lead sleeves

Figure 4-6 Cont'd
Historical Record Build-Up Roof

HISTORICAL RECORD-ASPHALT-SHINGLE

BUILDING NO. 2 USED FOR NCO Club
Permanent X Semi-permanent ____ Temporary ____ Year Roof was Applied 1980
Kind of Roof Deck: Sheathing boards X Thickness, in. 1"
S.S. ____ T&G X Plywood ____ Thickness, in. ____
Underlayment: None ____ Saturated felt 15# Paper ____
Asphalt shingles ____ Wood shingles ____ Other ____
Slope of Roof, in. per ft: 5" Area of roof, squares 100
Type of Shingles:
Square butt strip shingles: Exposure, in. 5 Weight 240 psf.
per square Thick-butt ____ Uniform thickness ____
Fire protection class: ____
Tabs cemented: Factory applied adhesive ____
Field applied cement ____
Other: (describe) Class C
Color of Roofing Granules: White
Flashings:
Valley flashings: Roll roofing X Asphalt shingles ____
Metal ____ Kind of metal ____
Drip edge: Roll roofing ____ Asphalt shingles ____ Metal ____
Kind of metal Aluminum
Vent flashings: (Describe) ____
Chimney and wall flashings: Roll roofing 55 Metal X
Kind of metal Aluminum
Previous Maintenance: (Describe briefly with dates)
Asphalt shingles: ____

Flashings: ____

Gutters and Downspouts
Type Metal ____ Guage ____ Thickness ____ Weight ____
Guarantees:
Roof Guarantees by: Expiration Date:

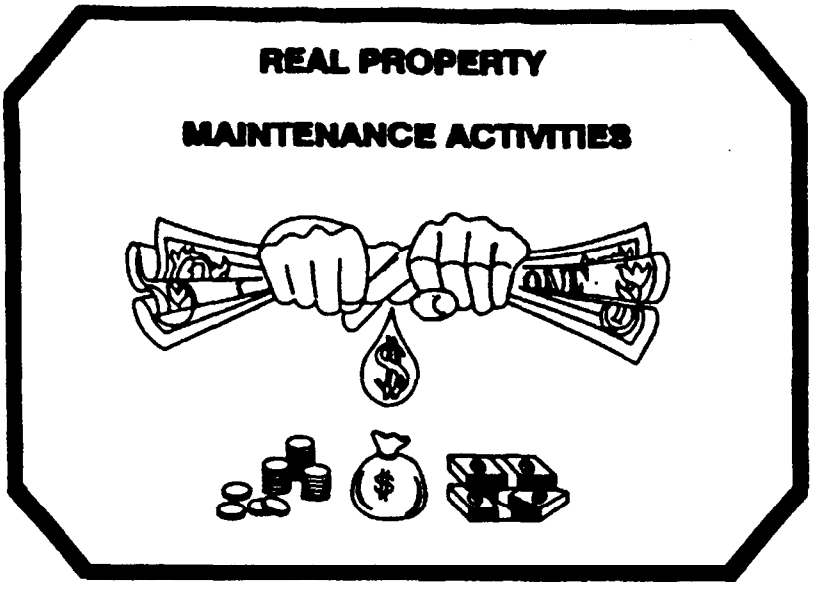
Figure 4-6 Cont'd
Historical Record Asphalt-Shingles

ment to establish life cycle data for replacement equipment and predict future replacement. Automation is recommended to track warranty information.

4.3.2 Cyclic Maintenance Planning Files. Programmed Maintenance in the areas of roofing, painting, flooring, overhauls, is recommended. As an illustration, a five year cycle for exterior painting would mean that 1/5th of the total exterior area should be painted each year. Individual structures are identified as they require painting and are prioritized on the applicable Maintenance Action Plan (see paragraph 4.5).

4.3.3 Completed Job Order Files. Completed Work Authorizations are filed in two ways: (1) in sequence of issue by number by year of issue in the Completed Job Order File, and (2) in sequence of issue by facility or Property Record Card Number in the Facility File.

4.3.4 Completed E/S Work Files. Completed E/S work authorizations are also filed in two ways: (1) in sequence by number by year of issue and (2) in sequence by facility or Property Record Card Number. Files should be purged at least annually after analysis and extraction of data to assist in decisions made concerning equipment/facility component replacement, vandalism problems, etc. Automated E/S operations can be purged to history for longer term retention. Extracts of annual E/S effort by type work by Facility is recommended for inclusion in the Facility File.



4.4 MANAGEMENT REVIEW AND APPRAISAL, See Chapter 1 Paragraph 1.5.1.9 for discussion of Facilities Management Program appraisal responsibilities. With respect to the Control Inspection process, the FMED should be concerned with whether inspections are conducted as planned; if inspections are thorough and accurate; if recommendations are technically sound; and if cost estimates are accurate within acceptable limits. The FMED should conduct random follow-up inspections to verify effectiveness. Cost effectiveness can be compared to the actual cost of correcting comparable items.

4.5 FACILITY MAINTENANCE PLANNING. Congressional interest in the use of Maintenance of Real Property (MRP) funds, especially the portion used to reduce maintenance and repair backlog reported on the AIS, established the need to develop a Maintenance Action Plan (MAP) comprised of AIS items to be accomplished with Maintenance and Repair (M&R) funds. The MAP is the activity's plan for spending MRP funds available for Minor and Specific work (LCC 06 and 07). This generally approximates 30% + 5% of M&R funding available. NAVFAC MO-321 provides clarification of Labor Class Codes. The MAP is a list of individual line items selected from the latest AIS (Code 1 deficiencies) which are the most critical, mission essential deficiencies. It should be prepared concurrent with the NAVCOMPT Budget and provide a firm spending plan for the Current Year portion of the Budget. Execution against the MAP must be continuously tracked to be effective. Some major claimants require submission of the MAP as part of the Navy Comptroller Budget package. Claimants may establish varying target amounts for MAP development, e.g. 75% of Minor and Specific "resource availability" as a MAP target. Procedural guidelines for developing a MAP are contained in Appendix F. Maintenance planning uses the results of the inspection program for multi-year programming. It also relies on accurate facility and equipment historical records. A longer plating horizon (normally five years) permits more efficient resource allocation and contract execution. This usually is more economical and permits better prioritization of deficiencies adversely affecting mission and readiness. If a five-year plan is desired, an estimated "Plan-Year" should be assigned to Deferrable deficiencies to enable programming in the appropriate year. Out-year planning must consider anticipated funding. The Detailed Deficiency List Inspection Report format is ideal for indicating "Plan-Year" at the time of deficiency identification. Public Works Centers have established a Long Range Maintenance Planning (LRMP) Program which is a service available on a reimbursable basis. Training of activity personnel and installation of the LRMP Program is also available from the Centers.

More details, including inspection times, are in Appendix G or obtained by contacting the nearest Public Works Center. LRMP provides the activity with systematic, in-depth documentation of maintenance and repair requirements forecasted over a multi-year planning cycle. This information is used to formulate funding strategies and to allocate resource dollars to critical mission needs and to predict future facility requirements.

CHAPTER 5. PREVENTIVE MAINTENANCE INSPECTION/SERVICE (PMI) PROCEDURES

5.1 OBJECTIVE. The primary objective of PMI is to ensure the continued reliability of dynamic equipment. PMI is a systematic approach to protect vital operating equipment from premature breakdown or replacement. A second objective is to assure efficient operation by providing systematic examination of equipment and systems and correcting minor deficiencies before they expand into major items for repair or replacement.

51.1 Discussion. PMI consists of examination, lubrication, minor adjustment, and minor repair. It is concerned primarily with items that, if disabled, would interfere with essential operations, endanger life and/or property, or involve high cost or long lead time for replacement. A viable and effective PMI program will assist in providing the command with the tools to avoid breakdown maintenance situations and is a cost effective vehicle for "protective maintenance." PMI alerts management to upcoming maintenance deficiencies in time for systematic planning and scheduling of repair work. This philosophy is in contrast to "breakdown maintenance" where the majority of repairs are done on an "emergency" basis. The system is used to schedule periodic inspections and servicing, monitor equipment repairs including labor and materials, and maintain inventory data including spare parts numbers, spare parts stocked, and set-up requirements where necessary. Some advantages of an effective PM program are:

- Reduced equipment downtime.
- More effective maintenance scheduling.
- Reduced emergency maintenance costs.
- Longer equipment life and better capital expenditure decisions.
- Reduced inventory shortages and overstocks.

Cost savings from PMI will not be immediate. Maintenance costs may rise initially, largely because previously hidden deficiencies will be uncovered. After the program is in operation for one or two years cost savings will result from reduced E/S work and efficiencies gained through planned and scheduled maintenance versus fire drill breakdown maintenance. PMI is highly repetitive work that can be planned, estimated and scheduled. Therefore, it should be issued as an estimated Standing Job Order, Labor Class Code (LCC) 03 and charged to the appropriate PMI Cost Account Number (CAN).

5.1.2 Management Prerequisite. If a PMI program is to function properly, full management support is essential. Many programs of this nature falter shortly after a vigorous beginning. Management must assign priority to this program to ensure its development, implementation, and continued accomplishment, with dynamic follow-up to ensure acceptable performance.

5.2 PMI INSPECTOR QUALIFICATIONS. PM Inspectors should hold a craftsman rate in their respective trades. They should be able to execute written instructions contained in the work authorization containing checkpoints and frequency of work to be performed. They should be able to detect abnormal equipment conditions and communicate needs in clear, concise, details to supervision and FMED via PM feedback reports.

5.3 ESTABLISHING A PMI PROGRAM. The following guidelines are needed to establish a PMI Program.

5.3.1 PMI Inventory. An inventory of all dynamic equipment needs to be developed. Formal record keeping, either manual or automated, is essential. When establishing the inventory, facilities and systems should be subdivided based on their relationship to mission, i.e., direct mission, indirect mission and non-mission related. Identify each piece of critical equipment and its components. Research these to determine the number of different procedures involved with each component that must be scheduled and performed and at what frequency. Once the number of components and procedures has been determined, inspection guides, checkpoints and frequencies will be needed for each procedure. A sample PMI record card for a manual system is shown in Figure 5-1. Equipment History Files should be set up for each piece of equipment. These files should contain manufacturers' literature, parts lists, drawings, etc., as well as completed PM cards. When establishing a PMI Program, it is important to involve Maintenance and Utilities Division personnel. Their corporate knowledge is critical in developing inventories, establishing checkpoints, and assigning priorities. The mechanic is the most important person in determining the job to be done as well as the most effective and efficient way to get it done. A PMI Inventory Record sheet, Figure 5-2 provides an example of procedures, decision points and necessary implementation actions.

Equipment of marginal mission importance should be excluded from the program. Overstatement of requirements can cause loss of interest by shop personnel if they see work authorized that is not critical to activity needs. The inventory should contain a spare parts catalog frequently needed by the mechanics.

5.3.2 PMI Contractor Assistance. Contractor assistance may be obtained to establish inventories and perform other functions to establish a PMI Program. Commercial firms can conduct inventories, label equipment, establish checkpoints and inspection guides, determine frequencies and generate PMI schedules. The activity

should not rely solely on contractor input but should carefully review the contractor's submission and make revisions based on detailed knowledge of their physical plant.

5.3.3 PMI Guides and Frequency. Inspection guides, checkpoints and frequency of inspection should be developed for each type of equipment in inventory. Determine:

- Appropriate inspection guidance. Detailed maintenance and servicing information can usually be found in the equipment manufacturer's manuals, and NAVFAC MO Manuals.
- Checkpoints and frequency of inspection for all inspection guides applicable to the work to be performed. Do not overstate frequencies or assign needless checkpoints.
- Actual time to inspect the checkpoint. This should be the actual on-site time to the tenth of an hour. Travel time, write-up, delay time, etc. will be added on the actual work authorization.

PREVENTIVE MAINTENANCE INSPECTION RECORD
NAVFACENGCOM

EQUIPMENT DESCRIPTION	PROPERTY NO.	LOCATION	CARD NO.
EQUIPMENT DATA		FREQ.	STD. HRS.
MANUFACTURER		MODEL NO.	GUIDE NO. / CHECK POINTS
SERIAL NUMBER	FRAME NO.	VOLTAGE / H.P.	
TYPE / BELT(S)		FILTER (S)	
OTHER			

PREVENTIVE MAINTENANCE INSPECTION RECORD

DATE	CHECK POINTS	ACTUAL INSP. HRS.	DEFICIENCY REPORT MADE		INSPECTOR' MECHANIC INITIALS	DATE	CHECK POINTS	ACTUAL INSP. HRS.	DEFICIENCY REPORT MADE		INSPECTOR' MECHANIC INITIALS
			YES	NO					YES	NO	

Figure 5-1
PM Inspection Record Card

PREVENTIVE MAINTENANCE INSPECTION
CHECK–OFF CARD

Use Inspection Guide:	CODES:		– Not Applicable	Work Center:	Charge to Job Order #:
	NI – Not Inspected	X – Adjustment Required	XX – Repairs Required		
	✓ – Satisfactory	(X) – Adjustment Accomplished	(XX) – Repairs Accomplished		

FACTORS AFFECTING INSPECTION

KEYS: TOOLS:

DATE INSPECTED	FREQ	CHECK POINTS SCHEDULED FOR INSPECTION	CHECKPOINTS 1 / 17 / 33	2 / 18 / 34	3 / 19 / 35	4 / 20 / 36	5 / 21 / 37	6 / 22 / 38	7 / 23 / 39	8 / 24 / 40	9 / 25 / 41	10 / 26 / 42	11 / 27 / 43	12 / 28 / 44	13 / 29 / 45	14 / 30 / 46	15 / 31 / 47	16 / 32 / 48	INSPECTOR'S INITIALS	INSPECTION HOURS STD.	INSPECTION HOURS USED	DEFICIENCY REPORT MADE? YES	DEFICIENCY REPORT MADE? NO

PROPERTY NO.:	DESCRIPTION:	CATEGORY CODE:	LOCATION:

Figure 5-2
PMI Inventory and Tracking Record

5.3.4 Inspection Record. A PMI Record Card should be developed for each item of inventory. Include data in subparagraph 5.3.3 as well as:

- Item identification including property number, nomenclature, make, model, and other pertinent information.
- Location - Building number, floor, room number, etc.

The PMI Record Card should be used during inspection and updated to reflect:

- Checkpoint inspected.
- Description of deficiencies corrected or reported. If the equipment is part of a building system, copies should be placed in the Facility File.
- Actual time spent on-site (tenths of an hour). After several PMIs of the item of equipment, the actual times should be averaged and compared to the estimate, differences reconciled and estimates revised. This gives more accurate data for planning and scheduling shop workload.
- Date of Inspection.
- Inspector's Initials - Inspectors should be rotated so different views on equipment and component condition may be obtained.

5.4 SCHEDULING INSPECTIONS. A 52 week schedule for each shop should be developed, spreading the work equally if possible. Work scheduling should consider location, type, frequency, and shop.

5.4.1 PMI Frequencies. Initial PMI frequencies should be based on manufacturers' guidelines. Experience and analysis of actual maintenance records will indicate the need to revise frequencies.

5.4.2 PMI Times. Time allowed to perform each PMI should be based on time needed to perform specific checklist items plus time for travel, delay, site access, etc. Time allowed should permit the inspector to complete service with tools, parts, and materials available in a hand-carried preplanned Inspection/Service kit. When circumstances require more than one hour per piece of equipment and the inspector does not have to return to the shop for additional tools, parts or materials, the effort should be completed. An Emergency/Service Work Authorization should be issued to account for time expended and the Inspection Record noted accordingly. NAVFAC P-717.0 "Preventive/Recurring Maintenance Handbook" contains Inspection/Service time standards for some items of dynamic equipment.

5.4.3 PMI Scheduling Considerations. It is not usually economical for all items to receive PMI. Annual operation and maintenance costs for these items should be monitored and required services analyzed. Perhaps some services could be performed as cyclic maintenance on Specific Job Orders issued at predetermined intervals, thus

eliminating need for PMI. Certain types of low cost, non-mission equipment such as fractional horsepower motors, window unit air conditioners (except for filter changes), water coolers, household refrigerators with sealed units, and automatic door closers may be replaced or repaired at time of breakdown more economically than under the PMI Program. Replacement items which are part of "vital" operating equipment should be stocked, or readily available at breakdown. Self Help programs, particularly in Family Housing and barracks, should be used to the fullest extent for PMI type work. It is imperative, however, that Public Works coordinate all work. The decision to PM one piece of equipment does not mean all like items require PMI. Environmental conditions, equipment age and usage vary between common equipment at the same activity and among activities. Proper scheduling permits orderly and efficient accomplishment of PMI. Similar equipment in the same general area of the base should be scheduled for PM consecutively. A single master schedule can be used if all PMI is performed by one Work Center. If more than one Work Center performs PMI, it is advantageous to prepare a schedule for each Work Center, to permit labor requirements leveling.

5.5 HANDLING MAJOR DEFICIENCIES. Equipment breakdowns discovered during PMI should be reported immediately to the supervisor or Work Reception Desk. Work beyond the scope of the PMI work authorization (usually major repairs and overhauls) should be recorded on a Control Inspection Report (Detailed Deficiency List) and forwarded to the Work Generation Branch via the Inspector's Supervisor (and Utilities Division if utilities equipment). The craftsman should include a priority, i.e., immediate, one year, etc. for correction of major deficiencies.

5.6 SUPPORT REQUIREMENTS. When management commits to establishing a PMI Program they must also commit resources to install and operate the Program. Initial PMI planning and estimating (P&E) requires approximately 12 P&E hours for each piece of major equipment of which 4 hours is for writing work orders and preparing the PMI schedule. Maintaining the PMI function requires approximately 1 P&E hour per 150 shop hours of PMI work authorized (or contract equivalent). This is needed to update work authorizations annually. In addition, a minimum of 160 hours are needed to review PMI program effectiveness, 1 hour per 50 items of PMI inventory to update inventory and adjust PMI requirements, and 1 hour per 50 PMI Reports to review Reports and coordinate actions needed to correct reported deficiencies.

5.7 **PROGRAM ANALYSIS.** Analysis of the PMI Program should be conducted routinely and especially prior to renewing work authorization. The analysis must question:

- Is all key equipment covered under PMI and is the level of service effective?
- Can the PMI frequency be reduced without impact?
- How does equipment replacement cost compare to annual PMI cost?

- Is PMI justified based on economics, mission, or both?
- Would it be more cost-efficient to not inspect and repair or replace when failure occurs?

CHAPTER 6. OPERATOR INSPECTION PROCEDURES

6.1 OBJECTIVE. The objective of Operator Inspection is to provide and assure efficient operation of mission essential equipment and systems which require the assignment and attendance of an operator.

6.2 RESPONSIBILITY. Operator Inspection is the responsibility of the person assigned to operate the equipment or system. Standard Operating Procedures (SOPs) should be developed and posted on the equipment or facilities, or written in the watch log. Deficiencies beyond the scope of the operator's assigned responsibilities should be immediately reported to the Work Generation Branch's Work Receptionist via the shop supervisor. During operation and equipment servicing, operators should be alert to symptoms, the need for diagnostic technical inspections and the potential need for major repair or overhaul. Although Operator Inspections may generate some Specific Work requirements as a result of routine examination, lubrication and minor adjustments of equipment to which they are assigned, their primary responsibility is to assure continuous operation of critical equipment and systems. Operator Inspection Program effectiveness should be evaluated during Control Inspection. Operators should continually monitor the PMI Program whether performed as part of their SOP or by shop forces and recommend adjustments when needed.

6.3 QUALIFICATIONS. Operators must be thoroughly familiar with the equipment or systems to which assigned. They require a complete knowledge of operational and safety requirements and a full understanding of SOPs. Independent assignment should not be made until the supervisor or lead operator has certified that the required skills and knowledge have been demonstrated. They should be able to detect abnormal operating conditions and take necessary corrective actions to avoid disruption, damage to property or hazard to personnel.

6.4 SCHEDULING INSPECTIONS. Operator inspections do not require scheduling since a specific operator is generally permanently assigned to the equipment or system.

6.5 PERFORMING OPERATOR INSPECTIONS. Operators should perform procedures outlined on assigned Preventive Maintenance Inspection/Service work authorizations and approved standard operating procedures.

CHAPTER 7. ANNUAL INSPECTION SUMMARY (AIS)

7.1 PURPOSE. The purpose of the Annual Inspection Summary (AIS) is to report the condition of Navy owned and operated real property, including temporary in-grants not out-leased or declared surplus.

7.2 OBJECTIVE. The objective of the AIS is to provide an annual assessment of facility condition and report the impact of condition on mission readiness. A secondary objective is to provide a means for the command chain to present unfunded facility condition problems to higher authority for programming consideration. Although the AIS is not a request for funds, it provides solid supporting justification for additional resources to correct facility problems. The AIS also provides:

- An assessment of the overall facility inspection program and inspection coverage.
- An assessment of individual facility condition.
- A budget-oriented report of facility resource requirements.
- The data needed to develop an executable Maintenance Action Plan (MAP) within resource constraints.
- Data needed to make an assessment of Base Readiness (BASEREP).

7.3 AIS FUNDING RELATIONSHIP. High interest in the deteriorating condition of Navy Real Property and severe reductions in facility repair funds prompted the Chief of Naval Operations (CNO), to institute procedures to identify, report and analyze facility deficiencies. These procedures:

- Emphasize inspection of facilities with direct bearing on activity readiness.
- Emphasize inspection of facilities with high economic impact on operations.
- Identify facility condition deficiencies by Investment Category.
- Prioritize facility problems as critical or deferrable.
- Require major claimants to review and verify AIS Reports.
- Synchronize facility condition reporting with the budget request programming cycle.
- Include Real Property Maintenance Activities (RPMA) program requirements as an agenda item for the Military Construction Review Board (MCRB) and require major claimants to defend their RPMA program before the MCRB based on AIS data.

- Permit CNO to view the MCON and RPMA Program as related requirements by Investment Category addressing both current and future needs jointly.
- Use the AIS and BASEREP as tools to help CNO formulate programming guidelines and define the direction of MCON and RPMA through the Future Years Defense Plan (FYDP).

7.4 PREPARATION OF THE AIS. There are three (3) different types of Annual Inspection Summaries depending on the types of property involved. Preparation instructions as well as reporting formats differ with each type. Specific guidance for preparation and reporting is contained in instructions promulgated by the commands involved. Only the Type "A" report is required by CNO. The three (3) types are:

TYPE "A". Navy owned and operated property, including facilities operated by contractor for research and development, not out-leased or declared surplus. OPNAVINST 11010.34 (series) contains forms and instructions for annual preparation. The majority of Navy activities are in this category and therefore subject to OPNAVINST 11010.34 series reporting requirements.

TYPE "B". Navy property, except industrial facilities, out-leased, declared surplus, or sold with a recapture provision. Para. 7.4.1 provides information for preparation of Type "B" AIS Reports.

TYPE "C". Industrial facilities not Navy operated. Reporting instructions for applicable activities will be issued by the requesting command. Para. 7.4.2 provides information for preparation of Type "C" AIS Reports.

7.4.1 Type "B" Annual Inspection Summary

1. **TYPE OF PROPERTY.** Type "B" Annual Inspection Summary (Figures 7-1 and 7-2) shall be used to report conditions for the following types of property:

a. Naval Property, not including Industrial Facilities, which is outleased, or outpermitted, to others.

b. Naval Property, not including Industrial Facilities, which has been declared excess or surplus and is pending lease, transfer or sale, and for which the Navy is responsible for protection, maintenance and repair until such time that this responsibility is transferred to the disposal agency. Also included is property of activities which have been disestablished and which are not covered under reports for other types of property.

c. Naval Property, not including Industrial Facilities, which has been sold or transferred with a provision for recapture in event of a national emergency.

2. **INSPECTION.**

a. **Category of Inspection. The** data for preparing a Type "B" Annual Inspection Summary are usually obtained from a one-time comprehensive inspection, as opposed to regular inspections.

b. **Inspection Party.** It is desirable that the inspector be accompanied by a representative of the lessee, or owner, so the lessee or owner will be more conversant with the deficiencies listed.

c. **Inspector's Recommendations.** The Inspector's Recommendations, as shown in the summary, shall be in consonance with facilities categorization code levels for Naval installations; the terms of the lease, permit, or sales contract; and the Condition Report for Leased Property, if one was prepared.

d. **Facilities Categorization Codes.** In general, the facilities categorization codes for outleased Naval property shall be the same as those for Naval installations in an active status. The lease, permit or sales contract will specify the lessee's, permittees' or owners' responsibility for maintenance and may modify the required amount of maintenance. Copies of such documents should be reviewed prior to each inspection. When a Condition Report for Leased Property has been made the maintenance required of the lessee cannot be more than that required to return the property to the condition shown in the report, unless the lease specifically states otherwise.

Type B ANNUAL INSPECTION SUMMARY NAVFAC 9-11014/48 (9-69) Supersedes NAVDOCKS 2711	Instructions for completing form are contained in NAVFAC MO-322	REPORT NAVFAC 11014.2

1 FROM Date By Direction	2 TO 3 VIA	4 PROPERTY 5 FOR YEAR ENDING
9 FIRST ENDORSEMENT FROM: 1. FORWARDED 2. COMMENTS ATTACHED Date By Direction	10 COPIES TO	6 SHEET OF 7 LEASE OR CONTRACT NO. 8 INSPECTED BY
11 ☐ LESSEE ☐ OWNER		12 EST. REACTIVATION COST $_____
13 FIELD REPRESENTATIVE OF GOVERNMENT		
14 MAINTENANCE RESPONSIBILITY		
15 MAINTENANCE ACTION		

DEFICIENCIES

CATEGORY CODE 16	DESCRIPTION 17	ESTIMATED COST LESSEE OROWNER 18	NAVY 19	PRIORITY 20

Figure 7-l
Form for Type "B" AIS

Type B ANNUAL INSPECTION SUMMARY CONTINUATION SHEET
NAVFAC 9-11014/48A (9-69)

REPORT NAVFAC 11014-2

1. PROPERTY	6 SHEET Of

CATEGORY CODE 16	DESCRIPTION 17	ESTIMATED COST		PRIORITY 20
		LESSEE OR OWNER 18	NAVY 19	

Figure 7-2
Form for Type “B” AIS

e. **Inspection Scheduling.** Inspections shall be scheduled no later than 12 months after the previous inspection.

3. **WHEN TO SUBMIT.** Submit upon request of the cognizant Major Claimant, or its field representative.

a. Who. For Naval property, not including Industrial Facilities, which is outleased or outpermitted to others, the Type "B" Annual Inspection Summary shall be prepared and forwarded to the Major Claimant as follows:

(1) For the above described property which is located on an active Naval activity having a Public Works Department, the Public Works Officer shall prepare and forward the Type "B" Annual Inspection Summary to the Major Claimant, via the EFD.

(2) For property in the custody of the Naval Facilities Engineering Command, the summary shall be prepared and forwarded to the NAVFACENGCOM by the EFD. For property not in the custody of the NAVFACENGCOM, and for property which has been sold or transferred with a provision for recapture the summary shall be prepared and forwarded by the EFD to the requesting Major Claimant and activity with one copy to the Commander, Naval Facilities Engineering Command.

4. **COMPOSITION.** The Type "B" Annual Inspection Summary shall be prepared on Form NAVFAC 9-11014/48 (9-69), Type "B" Annual Inspection Summary, and Form NAVFAC 9-11014/48A (9-69), Type "B" Annual Inspection Summary Continuation Sheet. No forwarding letter is required. Report symbol NAVFAC 11014-2 applies.

a. **Information Source.** This type of summary shall show all deficiencies, except those of a housekeeping nature (for example, items costing less than $1,000 to correct), together with estimated correction costs. When correction action on any deficiency has been initiated, but not completed, notation shall be made to that effect. The property subject to inclusion in the Type "B" Annual Inspection Summary includes not only that classified by Category Codes, but also shop cranes and hoists and Public Works shop equipment for maintenance and production facilities.

5. **INSTRUCTIONS FOR COMPLETING FORMS NAVFAC 9-11014/48 (9-69) AND 11014/48A (9-69), TYPE "B" ANNUAL INSPECTION SUMMARY AND TYPE "B" ANNUAL INSPECTION SUMMARY CONTINUATION SHEET.**

a. **Action-Activity.** The submitting activity shall provide appropriate entries in Blocks 1 through 5, 8 and 9, and Columns 10 through 13. (If the summary is prepared by the EFD, this action will be completed by the EFD.)

b. **Action-EFD.** The EFD shall provide appropriate entries in Blocks 7 and 14.

c. **Subparagraph Numbers.** Refer to Numbered Blocks or Columns on Forms NAVFAC 9-11014/48 and 9-11014/48A.

(1) **From.** Insert abbreviated title of Command and Activity forwarding report. If "By Direction" is not applicable, xxx it out. Indicate date report was forwarded.

(2) **To.** Insert title of Command or Office to whom report is to be sent, i.e., "Commander, NAVFAC (16)."

(3) **Via.** Insert title of the appropriate Command or Commands through which the Summary will be forwarded.

(4) **Property.** Identify the property or facility being reported, for example, "NAD Underground," "Former MCAS Eagle Mtn. Lake."

(5) **For Year Ending.** Show date for end of period covered by this report.

(6) **Sheet.** Show sheet number and total number of sheets in report.

(7) **Lease or Contract** No. Show lease or contract number, if applicable. If none, insert "None." For purpose of this report, licenses or permits are considered leases.

(8) **Inspection By.** Indicate the activity which performed the inspection, such as EFD, MCBC, etc.

(9) **First Endorsement.** To be completed by the first Command shown in Block 3 Indicate date report was forwarded. If "By Direction" is not applicable, cross it out. Comments may be added on either Form NAVFAC 9-11014/48 (9-69), or 9-11014/48A (9-69), if space is available, otherwise use attached sheets. If comments are not applicable, cross out item 2, "Comments attached." Additional endorsements, if required, may be made at the end of the summary.

(10) **Copies To.** Indicate by abbreviated titles those Commands or offices to whom copies of this report are to be forwarded.

(11) **Lessee, Owner.** Check appropriate box and provide name and address of lessee or owner.

(12) **Estimated Reactivation Cost.** Indicate the estimated current dollar cost that would be required to restore this property to an active operational status.

(13) **Field Representative of Government.** Insert the title of the Government's field representative designated in the lease.

(14) **Maintenance Responsibility.** Insert the clause number(s) in the lease, or the National Security Clause, which delineate(s) the maintenance responsibility of the lessee or owner. Provide a brief description of this clause.

(15) **Maintenance Action.** Cross out "(is)" or "(is not)" and cross out "(lease)" or "(contract)" in the printed statement as appropriate. If "(is)" is crossed out, describe briefly the action taken by the Government field representative to obtain effective lessee maintenance.

(16) thru (20) **Deficiencies.** The deficiencies discovered during the inspection are to be listed in Columns 16 through 20, except that deficiencies of a housekeeping nature (for example, items costing less than $1,000 to correct are not to be shown). When corrective action on any deficiency has been initiated, but not completed, the deficiency should be listed and notation "started" placed in Column 18 or 19.

(16) **Category Code.** The appropriate category code is to be taken from NAVFAC P-72, Category Codes for Navy Facilities Assets. Leave this column blank when deficiencies for Class III Plant Account items, or non-plant account items, are shown. For each deficiency listed, show in Column 16 the applicable Navy Category Code (5-digits).

(17) **Description.** List separately in Column 17 each deficiency to be included in the summary, including the apparent cause and the effect on the property, if the deficiency is not promptly corrected.

(18 & 19) **Estimated Cost.** For each deficiency listed, enter the estimated deficiency correction cost. Place the entry in Column 18 if the lessee or owner is responsible for correcting the deficiency. When there is a divided responsibility for correcting the deficiency, indicate the appropriate portion of the estimated cost in each of the columns. Provide a total for each column at the end of the summary.

(20) **Priority.** This Column is to be used only to classify the deficiencies that should be corrected by the Navy. Those items that are considered necessary to protect the Government's interest, and to maintain readiness of the property, are to be indicated as N1, N2, N3, etc.; the lower the figure representing highest urgency or priority. The remaining items that, while desirable, do not appear immediately essential to main-

tain readiness of the property, are to be indicated D1, D2, D3, etc.; the lower figures representing the most desirable.

7.4.2 Type "C" Annual Inspection Summary

1. **TYPE OF PROPERTY. A** Type "C" Annual Inspection Summary (Figure 7-3, 7-4) shall be used to report conditions for the following types of property:

a. Navy-owned Industrial Facilities which, during peacetime are leased, with termination provisions, for civilian operations; are maintained as an unused standby; or are being operated under a facilities contract.

b. Privately-owned Industrial Plants (Part of the Departmental Plant Reserve) in which the Navy has a legal right, through the National Security Clause or similar provisions, to occupancy, use or priority for production, if needed.

c. National Industrial Plant Reserve Plants.

2. **INSPECTION. The** data for preparing a Type "C" Annual Inspection Summary are obtained from a one-time comprehensive inspection, rather than a result of regular inspections. The summary shall provide a detailed report for use of the major claimant. Generally, the inspection scope should be sufficient to determine the general maintenance level attained and to indicate major deficiencies. Where a National Security Clause is contained in the sales document, the inspection should be sufficiently detailed to ensure that the owner fulfills his maintenance obligations.

a. **Inspection Party.** It is desirable that the inspector be accompanied by a representative of the lessee or owner, and a representative of the major claimant. In those instances where the property, lease, permit, license or sales contract is under the cognizance of the General Services Administration (GSA), an authorized GSA representative should accompany the inspector. In those instances where the maintenance obligation responsibility between the lessee, or owner, and the Navy may be difficult to ascertain, the inspector should be accompanied by a representative of the EFD, Real Estate Division, who shall provide, or obtain, prompt interpretation of maintenance responsibilities.

b. **Inspector's Recommendations.** The inspector's recommendations, as shown in the summary, shall be made in accordance with maintenance levels for industrial plants; terms of the lease, permit, license or sales contract; and condition report for leased property, if one was prepared. When a deficiency is noted, it is desirable that the parties concerned agree as to deficiency correction responsibility. If the parties concerned cannot agree as to deficiency correction responsibilities, all pertinent facts shall be noted in

TYPE C ANNUAL INSPECTION SUMMARY - 1
NAVFAC 8-11014/48 (9-69)
Supersedes NAVDOCKS 2713
S/N 0105-004-0060

Instructions for completing form are contained in NAVFAC MO-322

REPORT NAVFAC 11014-3

1. FROM

Date By Direction

2. TO

3. DATE OF INSPECTION

4. COPIES TO

5. SHEET 1 OF

6. ☐ OWNER ☐ LESSEE ☐ CONTRACTOR

7. LEASE OR CONTRACT NO.

8. TYPE OF PLANT ☐ DRP ☐ MIRP

9. INSPECTION PARTY

NAME TITLE REPRESENTING

10. DOD PLANT NUMBER

11. PLANNED MOBILIZATION PRODUCT

12. OVERALL CONDITION OF FACILITIES

PREVIOUS REPORT		THIS REPORT
☐	EXCELLENT	☐
☐	GOOD	☐
☐	FAIR	☐
☐	POOR	☐

13. REACTIVATION

COST $ _____

TIME _____ MANDAYS

14. USE - *Production similar to planned mobilization product.*

☐ YES ☐ NO

15. SPONSORING COMMAND

☐ ☐ ☐

16. CORRECTIVE MEASURES TAKEN SINCE LAST REPORT

SUMMARY OF DEFICIENCIES

METHOD OF ACCOMPLISHMENT	MARK	ESTIMATED COST (TO BE CORRECTED WITHIN) PREVIOUS REPORT 12 MONTHS 17	PREVIOUS REPORT 24 MONTHS 18	THIS REPORT 12 MONTHS 19	THIS REPORT 24 MONTHS 20
DEFICIENCIES TO BE CORRECTED BY LESSEE UNDER TERMS OF THE LEASE.	A				
DEFICIENCIES TO BE CORRECTED FROM MAINTENANCE FUNDS PROVIDED BY THE LESSEE.	B				
DEFICIENCIES TO BE CORRECTED FROM FUNDS PROVIDED BY THE SPONSORING COMMAND.	C				
DEFICIENCIES TO BE CORRECTED BY GSA.	D				
DEFICIENCIES TO BE CORRECTED BY OWNER UNDER TERMS OF THE SALES CONTRACT.	E				
TOTALS					

A-7253

Figure 7-3
Type "C" Annual Inspection Summary Form
Summary- 1

TYPE C ANNUAL INSPECTION SUMMARY - 2

NAVFAC 9-11014/80 (9-68)

Supersedes NAVDOCKS 2714

S/N 0109-004-0065

REPORT NAVFAC 11014-9

5. SHEET OF

6. OWNER, LESSEE, CONTRACTOR

7. LEASE OR CONTRACT NO.

	DESCRIPTION	QUANTITY	MARK	ESTIMATED COST			
				12 MONTHS	24 MONTHS	AT REACTIVATION	
				COST $	COST $	TIME MANDAYS	COST $
21	22	23	24	25	26	27	28

Figure 7-4
Type "C" Annual Inspection Summary Form
Summary-2

the summary in order that appropriate action may be taken at Departmental level. In the case of deficiencies at plants of the National Industrial Plant Reserve, it is most desirable that the EFD representative, and the authorized GSA field representative, agree on interpretation of the lease or sales contract, and the estimated deficiency costs that are the responsibility of the lessee or purchaser. In the case of plants that have been sold, the inspector's judgment must reflect the owner's responsibility contingent upon his use of the facility and seriousness of the deficiency. One-time comprehensive inspections providing rehabilitation estimates need not be made each year, provided significant changes have not occurred since the previous report.

c. **Maintenance Levels.** Maintenance levels for industrial plants are provided by the responsible major claimant. The lease, permit, license or sales contract, or the National Security Clause of such document, will specify lessees', permittees' or owners' responsibility for maintenance; and may modify the maintenance level required. Where copies of applicable leases, permits, licenses, or sales contracts are not available in the EFD, they should be reviewed at the office of the major claimant's field representative prior to each inspection. Where a Condition Report for Leased Property has been made, the maintenance required of the lessee cannot be more than that required to return the property to the condition shown in the report, unless the lease specifically states otherwise.

d. **Inspection Scheduling.** Industrial Plant inspections shall be scheduled by the EFD so summaries will reach the major claimant prior to 1 December of each year.

3. **WHEN TO SUBMIT.** Submit annually, at no later than 12-month intervals. Submit upon request of the cognizant major claimant, or its field representative, for all other property. When a cognizant major claimant, or its field representative, has previously requested that a property inspection be made, and the request is not limited to a one-time comprehensive inspection, the EFD shall submit summaries at no later than 12-month intervals. Summaries shall be forwarded to reach the cognizant major claimant prior to 1 December each year.

4. **WHO.** The summary shall be prepared by the geographical EFD in which the property is located. Following will be their responsibilities:

(1) Establishing inspection dates,

(2) Facilities inspection to determine their physical condition,

(3) Providing technical recommendations for deficiencies correction,

(4) Providing cost estimates for deficiencies correction, and

(5) Preparing the Type "C" Annual Inspection Summary.

5. **DISTRIBUTION.** Semi-annual summaries are made only at the request of the cognizant Major Claimant. Copies of the report will be submitted to the Major Claimant only.

6. **COMPOSITION.** The Type "C" Annual Inspection Summary shall be prepared on Form NAVFAC 9-11014/49 (9-69) Type "C" Annual Inspection Summary-1 and Form NAVFAC 9-11014/50 (9-69) Type "C" Annual Inspection Summary-2. Figure 7-5 and Figure 7-6 are sample completed forms of a Type "C" Annual Inspection Summary.

a. **Information Source.** This type of summary shall include all deficiencies, except those of a housekeeping nature (for example, items costing less than $1,000 to correct), together with an estimated correction cost. When corrective action on any deficiency has been initiated, but not completed, notation shall be made to that effect. The property subject to inclusion in the Type "C" Annual Inspection Summary also includes the following:

(1) Public works shop equipment for maintenance and production facilities.

(2) Fire extinguisher systems.

(3) Locomotives, railroad rolling stock, materials-handling equipment and weight-handling equipment.

(4) Production equipment only if requested by the cognizant major claimant or its field representative.

b. **Instructions for Completing Forms NAVFAC 9-11014/49 (9-69) Type** "C' **Annual Inspection Summary-l and NAVFAC 9-11014/50 (6-69) Type "C" Annual Inspection Summary-2.** Subparagraph numbers, following, refer to numbered Blocks or Columns on Forms NAVFAC 9-11014/49 and 9-11014/50:

(1) **From.** Insert abbreviated title of Command and Activity forwarding report. Signature of Commander/Commanding Officer, EFD, or other person authorized to forward report. If "By Direction" is not applicable, cross it out. Indicate date report was forwarded.

(2) **To.** Insert title of Command or Office to whom report is to be sent.

(3) **Date of Inspection.** Show date inspection was completed.

NAVFAC 9-11014/48 (REV.9/88)
S/N 0106-004-0060

REPORT NAVFAC 11014-2
REPORT NAVFAC 11014-3

ANNUAL INSPECTION SUMMARY

AIS TYPE "B" [ ] OR "C" [X] | FOR YEAR ENDING

1. FROM NAVAIRSYSCOM
DATE 20 MAR
BY DIRECTION Judithanne P. Hare

2. TO TELEDYNE CAE

3. DATE OF INSPECTION 28-31 JANUARY 1991

4. VIA

5. SHEET 1 OF 12

6. [ ] OWNER
[X] LESSEE TELEDYNE CAE
[ ] CONTR.

7. COPIES TO
NAVAIRSYSCOM
RDNAVFACENGCOM(CODE RD06)

8. LEASE/CONTRACT NO. N00019-90-E- 9006

10. INSPECTION PARTY

NAME	TITLE	REPRESENTING
SEE ATTACHED LIST		

9. TYPE OF PLANT
[ ] DRP [ ] NIRP [ ] NIROP [X] NWRP

11. DOD PLANT NUMBER N/A

12. PLAN MOBILIZATION PRODUCT
MISSLE GAS TURBINE ENGINES

14. REACTIVATION
COST _____
TIME ____ LABOR DAYS

15. USE PRODUCTION SIMILAR TO ITEM 12
[ ] YES [ ] NO

16. SPONSORING COMMAND
[ ] NAVSEA
[XX] NAVAIR
[ ] _____

13. OVERALL CONDITION OF FACILITIES

	PREVIOUS AIS	THIS AIS
EXCELLENT	[ ]	[ ]
GOOD	[X]	[XX]
FAIR	[ ]	[ ]
POOR	[ ]	[ ]

17. CORRECTIVE MEASURES TAKEN SINCE LAST AIS
SEE ATTACHED SHEETS

18. MAINTENANCE PROGRAM ASSESSMENT/ SPECIAL REQUIREMENTS
SEE ATTACHED SHEETS

19.-22. SUMMARY OF DEFICIENCIES (TYPE "C" ONLY)

METHOD OF ACCOMPLISHMENT CODE (MAC) DESCRIPTION	MAC	ESTIMATE COST (TO BE CORRECTED WITHIN) PREVIOUS AIS 12 MONTHS 19.	PREVIOUS AIS 24 MONTHS 20.	THIS AIS 12 MONTHS 21.	THIS AIS 24 MONTHS 22.
DEFICIENCIES TO BE CORRECTED BY LESSEE UNDER THE TERMS OF THE LEASE.	A	N/A	N/A	N/A	N/A
DEFICIENCIES TO BE CORRECTED FROM MAINT. FUNDS PROVIDED BY THE LESSEE.	B				
DEFICIENCIES TO BE CORRECTED FROM FUNDS PROVIDED BY THE SPONSORING COMMAND.	C	2,572,000	10,882,000	8,136,000	15,791,000
DEFICIENCIES TO BE CORRECTED BY GSA.	D				
DEFICIENCIES TO BE CORRECTED BY OWNER UNDER TERMS OF THE SALES CONTRACT.	E				
TOTALS		2,572,000	10,882,000	8,136,000	15,791,000

Figure 7-5
Example of Completed Form
Summary-l

TYPE C ANNUAL INSPECTION SUMMARY - 2

NAVFAC 11016-3

SHEET 4 OF 12

6. OWNER, LESSEE, CONTRACTOR: Teledyne CAE, Toledo, OH

7. LEASE OR CONTRACT NO.: N00019-90-E-9006

21	DESCRIPTION 22						
	Building:						
001	Replace one 500 KVA, 7,200/480 Volt electrical transformer in Substation 4.	LS	C	X			
002	Replace non-energy efficient window.	LS	C	X			
003	Rehabilitate hydraulic press pit.	LS	C	X			
004	R&lace ceiling in Metallurgical Lab.	LS	C		X		
005	Replace oil filled circuit breaker in Substation 1.	LS	C	X			
006	Remove asbestos, in air conditioning room. (Environmental compliance)	LS	C	X			
007	Replace creosote-block floor.	LS	C	X			
008	Replace office lighting fixtures.	LS	C	X			
009	Reduce cromic acid mist and other emissions in material cleaning, coating and plating area.	LS	C	X			
010	Replace flooring material that contains asbestos.	LS	c		X		
011	Repair major blisters and east/west expansion joints. Recoat main roof with fibrated aluminum coating.	LS	C	X			
012	Install fire wall in manufacturing area from north to south walls.	LS	C	X			
013	Consolidate office area air conditioning systems into one energy efficient system.	LS	C	X			
014	Insulate attics over office areas.	LS	C	X			
015	Rehabilitate steam heating delivery system to provide additional steam	LS	C	X			

Figure 7-6
Example of Completed Form
Summary-2

(4) **Copies To.** Indicate by abbreviated titles those Commands, or Offices to whom copies of this report are to be forwarded.

(5) **Sheet.** Show sheet number and total number of sheets in report.

(6) **Owner, Lessee or Contractor.** Check appropriate box and provide name and address of owner, lessee or contractor.

(7) **Lease or Contract** No. Show lease or contract number, if applicable. If none, insert "None." For purpose of this report, licenses and permits are considered leases.

(8) **Type of Plant.** Check appropriate box.

(9) **Inspection Party.** List members of inspection party by name, title and the organization they represent.

(10) **DOD Plant Number.** If this property has been assigned a DOD plant number, show that number. If none, insert "None."

(11) **Planned Mobilization Product.** Indicate the product planned for production in this plant when mobilization occurs.

(12) **Overall Condition of Facilities.** Check the appropriate box for this report and also check the appropriate box for the condition reported in the previous report.

(13) **Reactivation.** Show the estimated dollar cost and mandays necessary to place the facilities, not including production equipment, in the proper condition to produce the planned mobilization product. These entries should be the same as the sum total of Columns 27 and 28. If these estimates for reactivation have been repeated from the previous reports, notation shall be made to that effect.

(14) **Use.** If the plant is being used for its intended purpose, that is, the production of a product similar to the planned mobilization product, place a check mark in the YES box. If not, place a check mark in the NO box.

(15) **Sponsoring Command.** Check the appropriate box. If necessary, insert the brief title of the major claimant.

(16) **Corrective Measures Taken Since Last Report.** Provide a brief statement as to corrective measures taken and maintenance accomplished since the previous inspection. Discrepancies from the requirements of the lease or sales contract

shall be noted with an indication as to the cause of these discrepancies and the measures taken to correct them, including recommendations to higher authority. If necessary, continue on blank sheets.

(17 thru (20) **Summary of Deficiencies.** This part provides a summary of estimated deficiency costs discovered during the inspection, classified by the method for accomplishing the deficiencies correction. Data for Columns 19 and 20 are taken from Columns 25 and 26, classified by the mark in Column 24. Data for Columns 17 and 18 shall be taken from Columns 19 and 20 of the previous report.

(21) thru (28) **Deficiencies.** The deficiencies discovered during the inspection are to be listed in Columns 21 through 28, except that deficiencies of a housekeeping nature (for example, items costing less than $1,000 to correct) are not to be shown. When corrective action on any deficiency has been initiated, but not completed, the deficiency should be listed and a notation "Started" placed in Column 25 or 26. Deficiencies corrected before the inspection is completed should not be listed. Data is required for three classifications of deficiencies: (a) those requiring corrective action within the ensuing twelve months, (b) those requiring corrective action within the ensuing twenty-four months, and (c) those requiring corrective action only when the property is reactivated for mobilization production.

(22) **Description.** List separately each deficiency to be included in the summary, including the apparent cause and effect on the property if the deficiency is not promptly corrected.

(23) **Quantity.** For each deficiency listed in Column 22, indicate where appropriate, the quantity involved in correcting the deficiency. For example for paving, 1000 SY; for concrete work, 20 CY; for pipe replacement, 1275 LF.

(24) **Mark.** Each deficiency which should be corrected within the ensuing 12 or 24 month period shall be identified to indicate correction responsibility. The mark to be applied shall be determined by the Major Claimant's field representative as follows:

(a) For those deficiencies in outleased Departmental Reserve Plants, or outleased plants of the National Industrial Plant Reserve, in the custody of GSA, that should normally be corrected by the lessee at his own expense under the terms of the lease.

(b) For those deficiencies in outleased Departmental Reserve Plants that should be corrected from maintenance funds provided by the lessee in lieu of cash rental under the terms of the lease, and as directed by government representative for

the lease.

(c) For those deficiencies in outleased Departmental Reserve Plants that should be corrected from funds provided by the cognizant primary support authority.

(d) For those deficiencies in outleased plants of the National Industrial Plant Reserve, in the custody of GSA, that should be corrected by GSA with its appropriated funds. Indicate whether the deficiency is serious enough to recommend that GSA request an appropriation for correction in its next budget submission.

(e) For those deficiencies in Departmental Plants, or plants of the National Industrial Plant Reserve, which have been sold; that should be corrected by the purchaser (owner) under the terms of the sales contract.

(25) and (26) **Estimated Cost.** Provide a cost estimate for each deficiency correction listed in Column 22. If the deficiency should be corrected in the ensuing 12 months, list the cost estimate in Column 25. If the deficiency should be corrected within 13 to 24 months, list the cost estimate in Column 26.

(27) and (28) **Estimated Cost at Reactivation.** This covers the rehabilitation required to reactivate the plant, not including production equipment, for planned peak production, and includes the number of mandays required, Column 27. The dollar figure, Column 28, for reactivation rehabilitation is in addition to the cost for deficiencies correction within the 12 month and 24 month periods.

CHAPTER 8. THE BASE ENGINEERING SUPPORT, TECHNICAL (BEST) SYSTEM

8.1 OBJECTIVE. The objective of BEST is to provide Public Works personnel with a simple, flexible, interactive ADP system to track workload that is easy to operate.

8.2 DISCUSSION. BEST is a "tool" that automates the Navy's facilities management system. It consists of standard user-friendly software and features independent functional modules. There are separate equipment suites for maintenance, housing and transportation functional areas. The Maintenance/Utilities subsystem consists of five modules:

- Emergency Service (E/S)
- Shore Facilities Inspection (SFI)
- Work Input Control (WIC)
- Facilities Engineering Job Estimating (FEJE)
- Utilities (UT)

Central processing unit and storage device sizes and the number of work stations and printers will vary among activities. The modular system is flexible and versatile enough to accommodate most Public Works Department needs. A microcomputer version is available as well as the Honeywell mini version. Other functions are automated or being developed to complement the BEST system as part of a Public Works Management Automation (PWMA) micro initiative. BEST is a large portion of the PWMA pie. More detailed information concerning BEST and the five Maintenance/Utilities modules can be found in the "Management Guide, Maintenance/Utilities Subsystem, Base Engineering Support, Technical" and the user's manuals for the individual modules.

8.3 THE SFI MODULE. The SFI Module automates the Shore Facility Inspection/Assessment System. The SFI Module automates the normal clerical functions and scheduling operations associated with management of both the Control Inspection (CI) program for facilities and the Preventive Maintenance Inspection (PMI) programs for dynamic equipment. The SFI module contains two (2) sub-modules, CI and PMI.

8.3.1 Inventory. An effective use of the SFI Module is an accurate facilities and dynamic equipment inventory. This is essential for CI and PMI programs whether managed through the SFI Module or manually. It includes such items as facility number and name, priority, inspection frequency, map grid, and zone. PMI equipment inventories include equipment name, number and inventory code. After initial data input and start-up, a procedure for inventory update must be established to maintain accurate inventories. The FME Division is the focal point for gathering changes to data elements

and input of revisions into the system.

8.3.2 Inspection Frequencies And Standard Hours. CI and PMI require different methods of putting in inspection frequencies and standard hours.

8.3.2.1 CI Frequencies and Standard Hours. Frequencies and hours are entered directly into the CI sub-module. Type inspection, frequency, and standard hours are entered for each facility. Each inspection-can then be scheduled. After the final schedule is approved, the system generates inspection work orders. Upon completion, actual labor hours expended can be matched to the schedule for performance reports and unaccomplished inspections.

8.3.2.2 PMI Frequencies and Standard Hours. Frequencies and hours are estimated in the FEJE Module. A job order for a particular type of equipment is written, one phase per frequency. Appropriate checkpoints and pertinent equipment are attached. The job order is then sent from FEJE to SFI, ready for each phase to be scheduled.

8.3.3 Scheduling. The SFI module allows the user to decide which week of the fiscal year each inspection should take place and when the phases should be scheduled. In this manner total hours per quarter, month, or week can be obtained. This report helps the scheduler develop the Work Plan Summary for the Shop Load Plan in the WIC module.

8.3.4 Management Reports On Facility/Equipment Condition. The System can be queried at any time and management reports generated. This flexibility provides an effective tool to the PW manager to ascertain the current condition of any facility or piece of equipment. Overall, this leads to better work scheduling, project selection, and maintenance. A detailed description of management reports and indicators can be found in the BEST "Management Guide."

REFERENCES

Directives

1. DOD 4165.2, DOD Real Property Maintenance Activities Program

2. NAVFACINST 11010.44D, Shore Facilities Planning Manual

3. NAVFACINST 11012.139, Facility Post-Occupancy Evaluation Program

4. OPNAVINST 3501.167B, Shore Base Readiness Report (BASEREP)

5. OPNAVINST 11000.16A Command Responsibility for Shore Activity Land and Facilities

6. OPNAVINST 11010.23D, Management of Real Property Maintenance Activities

7. OPNAVINST 11010.34B, Annual Inspection Summary; Instructions for Preparation and Submission of

Manuals

1. OPNAVINST 11010.20E, Facilities Projects Manual

2. NAVMAT P-5100, Safety Precautions for Shore Activities

3. BEST Users' Manuals and Management Guide

4. NAVFAC MO-104, Maintenance of Waterfront Facilities

5. NAVFAC MO-110, Paints and Protective Coatings

6. NAVFAC MO-111, Building Maintenance; Structures

7. NAVFAC MO-113, Maintenance & Repair of Roofs

8. MIL-HDBK-1114/2, Maintenance & Operation of Heating Systems

9. NAVFAC MO-114, Vo1 3, Maintenance & Operation of Ventilation Systems

10. NAVFAC MO-116, Electrical Interior Facilities

11. NAVFAC MO-117, Maintenance of Fire Protection Systems

12. NAVFAC MO-124, Mooring Maintenance

13. NAVFAC MO-200, Facilities Engineering -- Electrical Exterior Facilities

14. NAVFAC MO-205, Central Heating & Steam Electric Generating Plants

15. NAVFAC MO-206, Operation and Maintenance of Air Compressor Plants

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

17. NAVFAC MO-210, Maintenance & Operation of Water Supply System, Treatment & Distribution Systems

18. NAVFAC MO-230, Maintenance & Operation of Petroleum Fuel Facilities

19. MIL-HDBK-1130, Inactivation, Caretaker Maintenance and Reactivation of Shore Facilities

20. NAVFAC MO-312, Wood Protection

21. NAVFAC MO-321, Facilities Management

22. NAVFAC MO-322, Inspection of Shore Facilities Volumes 2 and 3.

23. NAVFAC P-68, Contracting Manual

24. NAVFAC P-72, Department of the Navy Facility Category Codes

25. NAVFAC P-164, Detailed Inventory of Naval Shore Facilities

26. NAVFAC P-318, Organization and Functions for Public Works Departments

27. NAVFAC P-349, NAVFAC Documentation Index

28. NAVFAC P-700, (Series), Engineered Performance Standards

29. NAVFAC P-716, Unit Price Standards Handbook

30. NAVFAC P-930, Navy Family Housing Manual

APPENDIX A
Sample Guides For Developing Utility Systems Pseudofacility Numbers

PSEUDOFACILITY NUMBERS
(UTILITY SYSTEMS)

Pseudofacility numbers for activity utility systems are composed of two parts as follows:

Utility Service Code	**Utility Description Code**
(Numeric)	(One alpha character and one or two numeric characters)

TABLE 1
Utility Service Codes: (Choose One)

Codes	**Utility Service**
11	AC Electricity
12	DC Electricity
15	Fresh Water
16	Salt Water
21	Steam
23	Small Plants
24	Heating Systems
25	Sewage
26	Industrial Waste
31	Natural Gas
35	Compressed Air
36	Oxygen Distribution
37	Condensate

TABLE 2
Utility Description Codes: (Choose One)

	Description	Codes
1.	Electrical Cable =	A (Add to circuit; i.e. Al)
	Circuit Numbers =	1...89 Select one Number for each circuit
	Emergency Circuit	90-99
2.	Electrical Duct 3” and Under =	B (Add to holes; i.e., B-4)
	Number of Holes =	l...l5 Select one number for each duct
3.	Electrical Duct Over 3” =	C (Add to holes; i.e., C2)
	Number of Holes =	1...15
4.	Transformers =	D
	500KV and Under =	1...50/ number each transformer
	Over 500KV =	51...99/ as appropriate
5.	Transformer Pads =	E
	500KV and Under =	1...50/ number each pad
	Over 500KV =	51...99/ as appropriate
6.	Transformer Vaults	F
	500KV and Under =	1...50/ number each vault
	Over 500KV =	51...99/ as appropriate
7.	Transformer Manholes	G
	500KV and Under =	1...50/ number each manhole
	Over 500KV =	51...99/ as appropriate
8.	Street Lighting =	H
	500KV and Under =	1...50/ number each circuit/section
	Over 500KV =	51...99/ as appropriate

TABLE 2 (Continued)
Utility Description Codes: (Choose One)

	Description	Codes
9.	Electrical Sub-station =	1...99 For last two digits use assigned substation number or serialization beginning with 01 and ending with 99
10.	Telephone Duct 3” and under =	L (Add to holes; i e., L5)
	Number of Holes =	1...15 Select one number for each duct
11.	Telephone Duct over 3” =	M (Add to holes; i.e., M3)
	Number of Holes =	1...15 Select one number for each duct
12.	Piping =	P (Add to size: i.e., P4)
	Less than 2” =	1 Choose one number for each
	From 2” to 4 1/2” =	2 type of pipe
	5” to 10” =	3
	Over 12” =	4
13.	Steam Manholes =	R (Stand-alone Code)
14.	Sewer Manholes =	S (Stand-alone Code)
15.	Sewer Lines =	T (Stand-alone Code
16.	Gas/Air/Oxygen Lines	V (Stand-alone Code)

APPENDIX B
Minimum Recommended Frequencies
for
Control Inspection

Use of minimum Control Inspection frequencies is not mandatory. They will however be the basis for AIS Reporting to insure Navy-wide consistency in inspection coverage determination. They are also provided as a reasonable basis for Control Inspection scheduling. Activities may wish to accelerate frequencies based on special mission requirements.

CONTROL INSPECTION FREQUENCIES
(YEARS)

LMC[1]	Mission Relationship[2]	TYPE OF INSPECTION[3] Structural*	Electrical	Mechanical	Roofing
A	Direct Mission Support	2	2	2	1
B	Indirect Mission Support	3	3	3	1
C	Non-Mission Support	4	4	4	2
D&E	Inactive or Excess	5	5	5	3

*Inspect camels in group LMCs A&B annually and LMCs C&D bi-annually

NOTE 1. - Level of Maintenance Classification

NOTE 2. - Example. Active aircraft hangar = direct mission; admin, BEQ, BOQ = indirect mission support; recreational pavilion = non-mission support. Group designation is an individual activity decision based on common sense.

NOTE 3. - Specialized inspections of elevators, boilers, etc. are to be inspected at mandated frequencies as directed.

APPENDIX C
Control Inspection Times

These tables include times for physical inspection only. Initial data collection and analysis, travel, cost estimating and report writing are add-ons to times reflected. The tables are provided as a guide for preparing initial inspection schedules. During inspection performance, inspectors should record actual times for use in revising schedules.

STRUCTURAL INSPECTIONS	CONTROL INSPECTION FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	1.5	1.6	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.7	5.3	5.9	6.5	7.2	10.3	13.4	16.5
13xxx – Communications	1.7	2.1	2.4	2.8	3.1	3.5	3.9	4.2	4.6	5.3	6.0	6.7	7.4	8.1	11.7	15.3	18.9
14xxx – Land Operations Facilities	1.3	1.6	1.8	2.1	2.3	2.6	2.8	3.1	3.3	3.6	4.3	4.8	5.3	5.8	8.3	10.8	13.3
16xxx – Harbor & Coastal Facilities	4.5	5.6	6.6	7.7	8.8	9.9	11.0	12.1	13.2	15.3	17.5	19.7	21.9	24.0	34.9	45.8	56.6
17xxx – Training Facilities	0.9	1.2	1.5	1.8	2.1	2.4	2.7	2.9	3.2	3.8	4.4	5.0	5.6	6.2	9.1	12.1	15.0
21xxx – Maintenance Facilities	2.4	2.6	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.7	3.9	4.2	4.4	4.6	5.9	7.1	8.3
31xxx – Science Laboratories	2.3	2.7	3.1	3.5	3.9	4.3	4.7	5.1	5.5	6.3	7.1	7.9	8.7	9.5	13.5	17.5	21.5
41xxx – Liquid Fuel Storage, Bulk	2.0	2.0	2.0	2.0	2.0	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
42xxx – Ammunition Storage	2.0	2.0	2.0	2.0	2.0	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
44xxx – General Supply Buildings	3.6	3.7	3.8	3.9	3.9	4	4.1	4.2	4.2	4.4	4.5	4.7	4.8	5.0	5.7	6.5	7.2
61xxx – Administration Buildings	1.3	1.5	1.7	1.9	2.2	2.4	2.8	2.8	3.1	3.5	4.0	4.4	4.9	5.3	7.6	9.9	12.2
69xxx – Administrative Structures	1.0	1.0	1.0	1.0	1.0	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
71xxx – Family Housing	1.2	1.6	1.9	2.3	3.0	3	3.4	3.7	4.1	4.8	5.5	6.2	6.9	7.6	11.2	14.8	18.4
72xxx – Unaccompanied Personnel Hsg	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.8	3.9	4.1	4.3	4.5	4.7	4.9	5.8	6.8	7.7
73xxx – Community Facility – Personnel	1.9	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.8	3.0	3.2	3.4	3.6	4.5	5.4	6.3
74xxx – Community Facility – Morale	2.6	2.7	2.9	3.0	3.3	3.3	3.4	3.6	3.7	4.0	4.3	4.6	4.9	5.2	6.6	8.0	9.4
81xxx – Electrical Power	2.7	3.0	3.3	3.5	4.0	4	4.3	4.6	4.8	5.4	5.9	6.4	6.9	7.5	10.1	12.7	15.4
8xxxx – Utilities & Grounds (excludes Roads)	2.1	2.3	2.5	2.6	3.0	3	3.1	3.3	3.5	3.8	4.1	4.5	4.8	5.1	6.8	8.5	10.1

ELECTRICAL INSPECTIONS	CONTROL INSPECTION FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.6	2.8	3.1	3.4	3.6	3.9	5.3	6.6	8.0
13xxx – Communications	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.5	4.8	5.3	5.7	6.2	6.7	7.2	9.5	11.9	14.3
14xxx – Land Operations Facilities	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.4	3.8	4.2	4.6	5.0	7.0	9.0	11.0
17xxx – Training Facilities	3.0	3.4	3.7	4.1	4.4	4.8	5.2	5.5	5.9	6.6	7.3	8.0	8.7	9.4	13.0	16.6	20.2
21xxx – Maintenance Facilities	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.6	1.9	2.1	2.3	2.5	2.7	2.9	4.0	5.0	6.0
31xxx – Science Laboratories	7.0	7.6	8.3	8.9	9.5	10.2	10.8	11.5	12.1	13.4	14.7	16.0	17.2	18.5	24.9	31.3	37.8
41xxx – Liquid Fuel Storage, Bulk	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
42xxx – Ammunition Storage	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
44xxx – General Supply Buildings	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.5	2.9	3.3
61xxx – Administration Buildings	2.7	3.1	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.9	7.7	8.6	9.4	10.2	14.4	18.6	22.7
71xxx – Family Housing	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
72xxx – Unaccompanied Personnel Hsg	3.8	3.9	3.9	4.0	4.0	4.1	4.1	4.2	4.2	4.3	4.4	4.5	4.6	4.7	5.2	5.8	6.3
73xxx – Community Facility – Personnel	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.8	4.2	4.7	5.1	5.6	6.0	8.3	10.6	12.9
74xxx – Community Facility – Morale	3.6	3.8	3.9	4.0	4.1	4.3	4.4	4.5	4.6	4.9	5.1	5.4	5.6	5.8	7.1	8.3	9.5
81xxx – Electrical Power	1.7	2.2	2.8	3.3	3.8	4.4	4.9	5.4	6.0	7.1	5.1	9.2	10.3	11.4	16.7	22.1	27.5
8xxxx – Utilities & Grounds (excludes Roads)	4.9	5.0	5.1	5.3	5.4	5.5	5.7	5.8	5.9	6.2	6.4	6.7	7.0	7.2	8.5	9.9	11.2

MECHANICAL INSPECTIONS

CONTROL INSPECTION FUNCTION
Total Estimated Inspection Hours Per Facility

CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	4.8	6.8	8.8	10.8	12.8	14.8	16.8	18.8	20.8	24.8	28.8	32.8	36.8	40.8	60.8	80.0	100.8
13xxx – Communications	1.7	1.9	2.2	2.4	2.6	2.9	3.1	3.3	3.6	4.1	4.5	5.0	5.5	6.0	8.3	10.7	13.1
14xxx – Land Operations Facilities	1.2	1.4	1.6	1.7	1.9	2.1	2.2	2.4	2.6	2.9	3.2	3.6	3.9	4.2	5.9	7.6	9.2
17xxx – Training Facilities	2.6	2.7	2.7	2.8	2.8	2.9	2.9	3.0	3.0	3.2	3.3	3.4	3.5	3.6	4.1	4.7	5.2
21xxx – Maintenance Facilities	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	3.0	3.5	4.1
31xxx – Science Laboratories	3.5	4.1	4.6	5.1	5.6	6.1	6.7	7.2	7.7	8.8	9.5	10.8	11.9	12.9	18.1	23.3	28.5
41xxx – Liquid Fuel Storage, Bulk	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
42xxx – Ammunition Storage	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
44xxx – General Supply Buildings	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.9	2.3	2.7
61xxx – Administration Buildings	1.3	1.7	2.1	2.5	3.0	3.4	3.8	4.2	4.7	5.5	6.4	7.2	8.1	8.9	13.2	17.4	21.7
71xxx – Family Housing	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
72xxx – Unaccompanied Personnel Hsg	3.6	3.7	3.8	3.8	3.9	4.0	4.1	4.1	4.2	4.3	4.5	4.6	4.8	4.9	5.6	6.3	7.0
73xxx – Community Facility – Personnel	2.5	2.5	2.6	2.7	2.8	2.9	3.0	3.0	3.1	3.3	3.4	3.6	3.8	3.9	4.8	5.6	6.4
74xxx – Community Facility – Morale	2.7	2.8	2.9	3.0	3.2	3.3	3.4	3.6	3.7	3.9	4.2	4.5	4.7	5.0	6.2	7.5	8.8
81xxx – Electrical Power	2.0	2.3	2.7	3.0	3.3	3.6	3.9	4.2	4.5	5.2	5.8	6.4	7.0	7.7	10.8	13.9	17.0
8xxxx – Utilities & Grounds (excludes Roads)	2.2	2.3	2.5	2.6	2.8	2.9	3.0	3.2	3.3	3.6	3.9	4.2	4.5	4.8	6.2	7.6	9.0

ASPHALT SHINGLE ROOF INSPECTIONS	CONTROL INSPECTION FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	1.0	1.3	1.7
13xxx – Communications	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	1.2	1.5	1.9
14xxx – Land Operations Facilities	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.8	1.1	1.3
16xxx – Harbor & Coastal Facilities	0.4	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.5	1.8	2.0	2.2	2.4	3.5	4.6	5.7
17xxx – Training Facilities	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.9	1.2	1.5
21xxx – Maintenance Facilities	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8
31xxx – Science Laboratories	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.4	1.8	2.2
41xxx – Liquid Fuel Storage, Bulk	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
42xxx – Ammunition Storage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
44xxx – General Supply Buildings	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.7
61xxx – Administration Buildings	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.8	1.0	1.2
69xxx – Administrative Structures	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
71xxx – Family Housing	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	1.1	1.5	1.8
72xxx – Unaccompanied Personnel Hsg	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.8
73xxx – Community Facility – Personnel	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6
74xxx – Community Facility – Morale	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.8	0.9
81xxx – Electrical Power	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.6	0.7	0.7	1.0	1.3	1.5
8xxxx – Utilities & Grounds (excludes Roads)	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.7	0.8	1.0

BUILT–UP & STANDING SEAM METAL ROOF INSPECTIONS	CONTROL INSPECTION FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	0.4	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.2	1.3	1.5	1.6	1.8	2.6	3.4	4.1
13xxx – Communications	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.3	1.5	1.7	1.9	2.0	2.9	3.8	4.7
14xxx – Land Operations Facilities	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.8	1.0	1.1	1.2	1.3	1.5	2.1	2.7	3.3
16xxx – Harbor & Coastal Facilities	1.1	1.4	1.7	1.9	2.2	2.5	2.7	3.0	3.3	3.8	4.4	4.9	5.5	6.0	8.7	11.4	14.2
17xxx – Training Facilities	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	1.0	1.1	1.3	1.4	1.5	2.3	3.0	3.8
21xxx – Maintenance Facilities	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.5	1.8	2.1
31xxx – Science Laboratories	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.8	2.0	2.2	2.4	3.4	4.4	5.4
41xxx – Liquid Fuel Storage, Bulk	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
42xxx – Ammunition Storage	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
44xxx – General Supply Buildings	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.4	1.6	1.8
61xxx – Administration Buildings	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.9	2.5	3.0
69xxx – Administrative Structures	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
71xxx – Family Housing	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1.0	1.2	1.4	1.6	1.7	1.9	2.8	3.7	4.6
72xxx – Unaccompanied Personnel Hsg	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.5	1.7	1.9
73xxx – Community Facility – Personnel	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.1	1.4	1.6
74xxx – Community Facility – Morale	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.6	2.0	2.4
81xxx – Electrical Power	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.5	3.2	3.8
8xxxx – Utilities & Grounds (excludes Roads)	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.7	2.1	2.5

NON-BUILDING CONTROL INSPECTION TIMES

CAN	DESCRIPTION	UNIT OF MEASURE	INSPECTION TIME STR	ELEC	MECH	SPEC
7270	Breakwaters/Causeways	1000 LF	0.3			
7280	Graving Docks & Drydocks	Each	14.3	8.8	9.1	
7290	Marine Railways	100 LF	3.2	0.4	0.5	
72A0	Shipbuilding Ways	Each	12.0	4.0	8.0	
	Fleet Moorings	Each	0.6			0.6
7300	Surfaced Areas	1000 SY	0.2			
	Expansion Joints	1000 LF	0.2			
	Traffic Markings	1000 LF	0.2			
7400	Grounds	Acre	0.3			
7450	Drainage	1000 LF	0.4			
75N0	Family Housing Trailer	10000 SY	0.5			
7510	Railroad & Crane Trackage (2RL)	1000 LF	0.5			
	Trestles	100 LF	1.9			
	Trestles – Concrete Ties	100 LF				1.3
7520	Liquid Fuel Dispensing FAC	1000 gpm	0.2	0.3	0.5	
7530	Communication, Navigation and					
	Traffic Aid Facilities	Each	0.5	0.3	0.3	
7540	Communication Lines (Non–Tele)	Mile		2.6		
7550	Airfield Lighting	1000 LF		0.3		
75A0	Bulk Liquid Fuel Staorage Tanks	<1000 bbl	3.6		1.8	
	Bulk Liquid Fuel Storage Tanks	>1000 bbl	5.4		2.7	
75D0	Other Administrative Structure	Each	0.1			
75J0	Installed Refrig. Equip. In Walk–In					
	Refrigerators – Over 25 ton cap.	Each				1.5
75k0	Installed Cooling or Refrig. Equip.					
	– Under 3 ton cap.	Each		0.3	0.5	
	– From 3 to 5 ton cap.	Each		0.5	0.9	
	– From 15 to 100 ton cap.	Each		0.6	1.3	
	– From 100 to 800 ton cap.	Each		0.9	2.0	
75L0	Fences, Walls and Gates	1000 LF	0.3			
75M0	Antennas & Antenna Systems	Each	0.3	0.2		
	Swimming Pools	Each	0.6	0.6	1.1	
7610	Electrical Plants/Electrical					
	Power Generation Equipment	Each	2.0	0.2	0.5	
	Generation & Drive Unit	Each		1.8	1.4	
	Auxiliaries	All		1.4	0.8	
	Switchboard	Each		2.0	2.0	
	Heating Plant/Boilers:					
	<30 Hp	Each				2.7
	30 to 50 Hp	Each				8.0
	50 to 105 Hp	Each				12.0
7620	Heating Plants over 3,500K BTU/Hr	Each	1.0	0.7	1.0	
7630	Heating Plants					
	750,000 to 3,500,000 BTU/Hr	Each	1.0	0.7	1.0	
7640	Steam Plants	Each	1.0	0.7	1.0	
7650	Water Treatment Facilities	1000 LF			0.5	

CAN	DESCRIPTION	UNIT OF MEASURE	INSPECTION TIME STR	ELEC	MECH	SPEC
76F0	Liquid Storage Facilities					
	Tanks – Elevated:					
	<10,000 gal	Each	2.7	0.5	2.2	
	>10,000 gal	Each	4.0	0.8	3.3	
	Tanks – Ground Level:					
	<10,000 gal	Each	1.9	0.5	1.5	
	>10,000 gal	Each	2.9	0.8	2.3	
7670	Sewage Plants/Pumping & Treatment	100K gal/day	0.8	1.2	1.5	
	Pumps	Each		0.2	0.3	
7690	Compressed Air Plants & Systems					
	(Pneumatic Power)	1000 LF	2.3	1.5	1.0	
76C0	Ice Mfg. Equip. Installed in Facilities					
	Class 210 & 220 (CAN 7120)	Each			1.5	
76D0	Cooling & Refrig. Equip. Installed on					
	Fac. Class 430 (Storage – Cold)	Each			1.5	
76E0	Hot Water Heaters					
	<30 gal	Each			0.2	
	30 to 300 gal	Each			0.5	
	>300 gal	Each			0.8	
7710	Electrical Power & Lighting: *					
	Distribution –					
	Overhead	1000 LF		0.5		
	Underground	1000 LF		0.7		
	Manholes –					
	Distribution Lines	Each		0.7		
	Street Lighting	Each		0.5		
	Transformers –					
	Poles	Each		0.3		
	Substations	Each		1.0		
	Stations & Vaults	Each		0.5		
	Steam & Hot Water: *					
	Above Ground	1000 LF			0.6	
	Tunnels & Covered Trenches	1000 LF	1.4			
	Manholes	Each			0.4	
	Condensate Pumps	Each			0.3	
7720	Steam & Hot Water for Plants					
	>3,500,000 BTU/Hr	1000 LF			0.5	
	750,000 to 3,500,000 BTU/Hr	1000 LF			0.5	
7730	Potable Water	1000 LF			0.4	
7740	Nonpotable Water	1000 LF			0.4	
7750	Fire Protection Water	1000 LF			0.4	
7760	Sewage & Waste Collection	1000 LF			0.5	
7770	Gas Distribution *					
	Piping	1000 LF			0.2	
	Gages & Meters	Each			0.2	
	Regulators	Each			0.2	

• Safety Requirement - 2 Persons

NON-BUILDING CONTROL INSPECTION TIMES

CAN	DESCRIPTION	UNIT OF MEASURE	INSPECTION TIME STR	ELEC	MECH	SPEC
7770	Gas Distribution (Cont'd) *					
	Valves	Each			0.1	
7780	Communication Sys. – Admin. Tele. *					
	Overhead	1000 LF		0.5		
	Underground	1000 LF		0.3		
	Telephone Handholes	Each		0.4		
	Switchboard & Centrals	Each		8.0		
7790	Fire Alarms					
	Overhead	1000 LF		0.5	1.0	
	Underground	1000 LF		0.5		
	Boxes	Each		0.1		
	Sewage & Storm Drainage *					
	Piping	1000 LF			0.5	
	Manholes	Each			0.5	
	Sump Pumps	Each		0.3	0.3	
	Bridges	1000 LF	0.2			
	Cathodic Protection System	Each		5.2		
	Cathodic Protection Test System	Each		0.3		
	Chimneys & Stacks (Boiler Plants)	Each	3.7			
	Gangways & Brows	Each	0.5			
	Unfired Pressure Vessels					
	<500 cubic feet	Each				0.5
	500 to 1000 cubic feet	Each				1.0
	1000 to 2000 cubic feet	Each				1.5
	>2000 cubic feet	Each				2.0
	Internal (Boroscope)	Each				2.0
	Crane					
	IET Bridge 3 to 10 tons	Each	0.5		0.7	
	OET Bridge 10 to 30 tons	Each	0.5		1.0	
	OET Bridge 30 to 50 tons	Each	0.5	0.5	1.7	
	OET Wall	Each	0.5		0.9	
	Jib and Pillar	Each			0.7	
	Monorail System	1000 LF	0.3	0.2	1.7	
	Single Hoist	Each			0.5	
	Floating 100 to 200 tons	Each	0.5	0.5	3.3	
	Locomotive 30 to 40 tons	Each	0.7	0.3	2.0	
	Truck and Wagon 10 to 20 tons	Each	0.7	0.7	2.0	
	Gantry 10 to 40 tons	Each			2.2	
	Tower 30 to 50 tons	Each			2.9	
	Hammerhead 50 to 100 tons	Each			3.4	
	Tractor–Crawler 3 to 5 tons	Each			0.8	
	Forklift	Each			0.6	
	Elevators					
	Cable	Each				2.5
	Hydraulic	Each				1.5
	Hand Operated	Each				0.5

* Safety Requirement – 2 Persons

NON-BUILDING CONTROL INSPECTION TIMES

CAN	DESCRIPTION	UNIT OF MEASURE	INSPECTION TIME STR	ELEC	MECH	SPEC
7790 (Cont'd):						
	Elevators (Cont'd):					
	<2000 lbs *	Each				2.5
	2,000 to 4,000 lbs *	Each				6.0
	4,000 to 8,000 lbs *	Each				8.0
	>8,000 lbs *	Each				10.0
	Platform Lifts and Dumbwaiters	Each			0.2	0.5
	Escalators	Each				1.1
	Galley Hood and Ducts	Each			0.3	
	Towers	100 ft of				
		Vertical Height				2.0
	High Pressure Air System > 3,000 psig			0.5	3.0	
	Heating Systems	Each			4.0	
	Water Treatment & Pumping Plants	100K gal/day	0.8	0.4	1.5	1.5
	Fire Sprinkler System – Deluge	Each			2.0	
	Air Traffic Aids	Each		0.2		
	Wells	Each		0.1	0.1	
	Windbreaks	1,000 LF	0.5			

• Safety Requirement - 2 Persons

CONTROL INSPECTION TIME TABLES
(EXAMPLE)

Times are for inspection only. After inspection times are selected, add the following labor hours per facility.

	Structural/Roofing	Mechanical	Electrical
Cost Estimate	1.9 hrs/est	1.9 hrs/est	1.9 hrs/est

Travel (based on travel zone in which the facility is located)

It must be noted, the Inspection times determined are average times and may differ due to differences in the way facilities are arranged and the variety of uses within each facility.

In determining the total square feet of a facility, look at all category codes for that facility and add them together. Use the dominant category code when determining the inspection time. Additional time should be added if security clearances or escorts are required.

Example: How much time will be required to accomplish a complete inspection with cost estimates in Category 61XXX? The facility is a single story facility located in Travel Zone 5 and the sum of all Cat. Code Sq. footage is 25000 SF. Facility has built-up roof. No abnormal conditions or facility layout problem exist.

		Inspection Package Time			
		Structural	Electrical	Mechanical	Roofing
1.	From tables	12.20	22.70	21.70	3.0
2.	Cost Estimate Prep.	1.90	1.90	1.90	1.9
3.	Travel				
	a. Trips*	2	3	3	1
	b. Time/Trip	.55	.55	.55	.55
	c. Travel Time	1.10	1.65	1.65	.55
4.	Total (1 + 2 + 3c)	15.20	26.25	25.25	5.45
				or 72.15 Hours	

*Inspection time divided by 8 hrs/day.

APPENDIX D
Facility Inspection Checklist

This form is used as a cover sheet for the completed Inspection Report package. It tells management at a glance what facility components were inspected. It lists items to be inspected.

DATE: _____

FACILITY INSPECTION CHECKLIST

FACILITYNUMBER: _____ REPORT NO: _____

INSPECTOR(S): _____ INSP. HOURS: _____

_____

ENTER: (S) = SATISFACTORY or (U) = UNSATISFACTORY

ELECTRICAL		MECHANICAL	
INCOMING SERVICE		PLUMBLING	
MAIN DISTRIBUTION PANELS		HEATING	
POWER/LIGHTING PANELS		COOLING	
ELECTRICAL DEVICES		EXHAUST/VENTILATION	
ELECT. WIRING NETWORK		TEMPERATURE CONTROLS	
_____		_____	
_____		_____	

EXTERIOR		INTERIOR	
ROOF		FLOORS	
WALLS		WALLS	
FOUNDATON		CEILINGS	
WINDOWS		DOORS	
GENERAL		STAIRWAYS	
_____		_____	
_____		_____	

SAFETY/HEALTH		SITE	
EMERGENCY LIGHTS		SIDEWALKS	
EXIT LIGHTS		AREAWAYS	
DETECTION DEVICES		DRAINAGE	
PROTECTION SYSTEMS		ROADS	
WATER TREATMENT		PARKING LOTS	
SEWAGE TREATMENT		_____	
FOOD SERVICE		_____	
_____		_____	
_____		_____	

NOTES:

_____

_____

_____

_____

_____

APPENDIX E

WORK PACKAGING

Work identified by inspection is used for AIS, budget, contract and shop loading decisions. This Appendix is one technique for “packaging” deficiencies together the way it makes sense to do the job.

WORK PACKAGING

I. INTRODUCTION

Inspection reports, properly formatted, can enhance the effectiveness of the maintenance management system to execute work. Effectiveness is greatly improved by a Work Packaging Technique. The idea is to package or collect deficiencies together into workable jobs ready for accomplishment. If followed, the packaging technique can minimize data entries for manual or automated maintenance management systems. The reduction of the number of entries in a work control system allows Facility Managers to concentrate on fewer jobs and places emphasis on correction of problems. It reduces the number of resource management decisions and planner/estimator preparation time. Work Packaging is also a reporting technique that assists facility inspectors. The technique allows inspector latitude to prioritize, recommend, and analyze inspection deficiencies. This is critical to the preparation of the Annual Inspection Summary and Maintenance Action Plan.

DEVELOPING A PACKAGING SYSTEM

To implement the work packaging system, facility inspectors must complete the Facility Condition Report Detailed Listing (Exhibit-1) listing deficiencies found during the on-site inspection. Inspection reports should be prepared for each discipline e.g., structural, electrical, and mechanical. Completed inspection reports are then analyzed by the inspection team to determine how the work should logically be accomplished. The team decides what deficiencies can be worked together as a package (A, B, C, D, etc.). These packages contain deficiencies that should logically be worked together as single, or multi-craft in-house or contract jobs.

The blocks in the description area of the inspection report denote individual packages. Exhibit-2 is a Work Input Control (WIC) / Inspection Summary Sheet used with the packaging technique. It is prepared by the inspection team as the work packages are developed. A separate WIC summary sheet for each package designator A, B, C is required. Individual summary sheets are needed because each represents a separate job. The packaging summary sheets are used as input to an automated data base, i.e., WIC module of “BEST’ or to update a manual system. Exhibit-3 is a sample work package demonstrating the use of the technique.

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTINGS

Page ___ of ___

Date _____

Facility Number _____

Inspector _____

Inspection Time _____

Type Inspection: S E M O

PKG	E 1 2 3 4 5	DEFICIENCY DESCRIPTION	W/C	LAB HRS.	LAB COST	MATL COST	TOTAL COST

BASIC DEFINITIONS

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTING (EXHIBIT 1)

DATE	WHEN THE INSPECTION WAS CONDUCTED
INSPECTION TIME	ACTUAL TIME USED TO CONDUCT THE INSPECTION AND PREPARE THE REPORT
FACILITY NUMBER	THE FACILITY NUMBER ASSIGNED TO THE FACILITY
TYPE INSPECTION	CATEGORY OF INSPECTION STRUCTURAL, ELECTRICAL, MECHANICAL, OTHER
INSPECTOR	NAME OF THE PERSON CONDUCTING THE INSPECTION
PKG	PACKAGE IDENTIFIER (USE A, B, C, D, ETC:)
E	CHECK THIS BLOCK IF AN EMERGENCY/SERVICE CALL WAS SUBMITTED TO CORRECT THE DEFICIENCY (E/S CALL NUMBER SHOULD BE ANNOTATED IN THE DESCRIPTION BLOCK FOR INSPECTOR TRACKING)
1 THRU 5	THE YEAR CORRECTION OF THE DEFICIENCY IS REQUIRED BY.
DEFICIENCY DESCRIPTION	DETAILED DESCRIPTION OF THE DEFICIENCY FOUND
W/C	CRAFT OR WORK CENTER THAT SHOULD CORRECT THE DEFICIENCY. A “C” SHOULD BE USED WHEN CONTRACT ACCOMPLISHMENT IS RECOMMENDED
LAB HRS	THE ESTIMATED LABOR HOURS TO CORRECT THE DEFICIENCY, LEAVE BLANK IF W/C BLOCK IS “C”
LAB COST	THE LABOR COST IS THE ACTIVITY RATE X LABOR HOURS, LEAVE BLANK IF W/C BLOCK IS “C”
MATL COST	MATERIAL COST, LEAVE BLANK IF W/C BLOCK IS “C”
TOTAL COST	ENTER ESTIMATED TOTAL CONTRACT ESTIMATE.

WIC / INSPECTION SUMMARY

SHORT DESCRIPTION: _____

PW NUMBER	FACILITY	DC	FUND SOURCE
		1 2	

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E M Q S D	M R A I	1 2 3

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	Y N	MT RP DM DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
EL ME ST PT RF OT SP		C M S V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST

COMMENTS:

ES CALLS REQUIRED Y N

Exhibit-2

WIC / INSPECTION SUMMARY

PW NUMBER - THE ASSIGNED PUBLIC WORKS IDENTIFICATION NUMBER CREATED TO TRACK THE JOB FROM CRADLE TO GRAVE.

FACILITY - THE FACILITY NUMBER AS NOTED ON THE P-164 REAL PROPERTY INVENTORY

DEFICIENCY CODE - A SINGLE DIGIT CODE REFERRING TO THE COMMANDING OFFICER'S FUNDING LIMITATION

(1) WITHIN CO'S LIMIT
(2) ABOVE CO'S LIMIT

FUND SOURCE - A FOUR DIGIT CODE REFERRING TO THE FUND SOURCE eg: 1804 O&MN

DEFICIENCY TYPE- A SINGLE ALPHA CHARACTER DENOTING ONE OF THE FOLLOWING:

(E)CATASTROPHIC/ENVIRONMENTAL
(M)LOSS OF MISSION
(S)SAFETY
(Q)QUALITY OF LIFE
(D)DEFERRABLE

E, M, S, Q ARE CRITICAL DEFICIENCY TYPES OF SUCH SEVERITY THAT CORRECTIVE ACTION SHOULD BE INITIATED WITHIN TWELVE MONTHS.

M/R/ALTER/IMPROVE - A SINGLE ALPHA CHARACTER DENOTING ONE OF THE FOLLOWING:

(M) MAINTENANCE
(R) REPAIR
(A) ALTERATIONS
(1) IMPROVEMENTS

ACC YEAR - A DESIGNATION THAT DENOTES THE YEAR THE DEFICIENCY SHOULD BE CORRECTED:

(1) ONE YEAR
(2) Two YEARS
(3) THREE YEARS

SPECIAL PROJECT NUMBER - A SPECIAL PROJECT NUMBER IS USUALLY REQUIRED WHEN A DEFICIENCY EXCEEDS THE COMMANDING OFFICERS APPROVAL LIMIT. *E.G., IT REQUIRES FUNDING BY THE MAJOR CLAIMANT:

AIS REPORT- IF THE DEFICIENCY SHOULD BE PUT ON THE ANNUAL INSPECTION SUMMARY A (Y) YES) OR (N) NO) IS REQUIRED.

ALTERATION, IMPROVEMENTS AND CONSTRUCTION ARE NOT AIS CATEGORY OF WORK REQUIRED.

DEFICIENCY DESCRIPTION CATEGORY- A DESCRIPTION OF THE CATEGORY OF WORK REQUIRED:

(MT) MAINTENANCE
(RP) REPAIR
(DM) DEMOLITION
(DS) DESIGN

DEFICIENCY DESCRIPTION WORK TYPE - THE TYPE OF WORK INVOLVED:

(EL) ELECTRICAL
(ME) MECHANICAL
(ST) STRUCTURAL
(PT) PAINT
(RF) ROOF
(OT) OTHER
(SP) SPECIALIZED

WORKSOURCE - HOW THE WORK WAS GENERATED:

(I) INSPECTION
(W) WORK REQUEST

METHOD - THE METHOD OF ACCOMPLISHMENT.

(C) CONTRACTOR
(M) MILITARY
(S) SHOPS
(V) VENDOR

COST DATA - THIS IS A SUMMARY OF EFFORT REQUIRED TO ACCOMPLISH THE JOB. COMPLETE THIS SECTION USING THE INFORMATION FROM THE FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTING (EXHIBIT 1)

COMMENTS- NOTE ANY PERTINENT INFORMATION IN THIS SECTION

E/S CALLS REQUIRED- IF EMERGENCY OR SERVICE CALLS ARE ISSUED TO CORRECT A DEFICIENCY NOTE ON THE INSPECTORS REPORT CHECK THE APPROPRIATE BLOCK:

(Y) YES
(N) NO

WIC / INSPECTION SUMMARY

SHORT DESCRIPTION: STRUCT AND MECH REPAIRS

PW NUMBER	FACILITY	DC	FUND SOURCE
	N23	1 2	1804

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E M C S D	M R A I	1 2 3

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	Y N	MT RP DM DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
EL ME ST PT RF OT SP	I	C M S V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST
01C	80	1600	2046	3640
12	16	320	60	380

COMMENTS:

ES CALLS REQUIRED Y N

Exhibit-3

WIC / INSPECTION SUMMARY

SHORT DESCRIPTION: ELECTRICAL REPAIRS

PW NUMBER	FACILITY	DC	FUND SOURCE
	N23	[X] 1 2	1804

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E M Q [X] S D	M [X] R A I	[X] 1 2 3

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	[X] Y N	MT [X] RP DM DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
[X] EL ME ST PT RF OT SP	I	C M [X] S V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST
21	24	480	480	960

COMMENTS:

ES CALLS REQUIRED Y N

Exhibit-3

WIC / INSPECTION SUMMARY

SHORT DESCRIPTION: STRUCT, ELECT, MECH REPRS.

PW NUMBER	FACILITY	DC	FUND SOURCE
	N23	[X] 1 / 2	1804

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E / M / Q / S / [X] D	M / [X] R / A / I	1 / [X] 2 / 3

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	[X] Y / N	MT / [X] EP / DM / DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
EL / ME / [X] ST / PT / RF / OT / SP	I	C / M / [X] S / V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST
01P	72	1440	220	1660
01C	8	160	200	360
21	16	320	100	420
23	32	640	1000	1640
12	24	480	240	720

COMMENTS:

ES CALLS REQUIRED Y N

Exhibit-3

WIC / INSPECTION SUMMARY

SHORT DESCRIPTION: REPLACE BUILT-UP ROOF

PW NUMBER	FACILITY	DC	FUND SOURCE
	N23	1 [X] 2	1804

DEFICIENCY TYPE	M / R / ALTER / IMPROVE	ACC YR
E M [X] S D	M [X] A I	1 2 [X]

SPECIAL PROJECT NO.	AIS REPORT	DEFICIENCY DESCRIPTION CATEGORY
	[X] N	MT [X] DM DS

DEFICIENCY DESCRIPTION WORK TYPE	WORK SOURCE	METHOD
EL ME [X] PT RF OT SP	I	[X] M S V

COST DATA

WORK CENTER	LABOR HOURS	LABOR COST	MATERIAL COST	TOTAL COST
C				250,000

COMMENTS:
* SPECIAL PROJECT REQ'D, SEND TO ENGINEERING FOR PROJECT SUBMITTAL

ES CALLS REQUIRED [Y] [N]

Exhibit-3

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTINGS

Date 11-06-91

Facility Number N-23

Inspector H. MATECKI

Page 1 of 1

Inspection Time 4.0 HRS

Type Inspection: [X] E M O

PKG	E	1	2	3	4	5	DEFICIENCY DESCRIPTION	W/C	LAB HRS.	LAB COST	MATL COST	TOTAL COST
A		X					REPLACE (12) EXTERIOR WOODEN WINDOWS, BADLY DETERIORATED AT SILLS	O/C	48	960	1800	2760
C			X				PATCH APPROX 40 SF OF SPALLING PLASTER ON NORTHWEST SIDE OF BUILDING	O/P	24	480	100	580
C				X			REPLACE 800 SF OF DETERIORATED, BADLY STAINED ACCOUSTICAL CEILING TILES (2'x2') RMS 12,13,14,15	O/C	8	160	200	360
C			X				PAINT INTERIOR WALLS RMS 12,13,14,15 PAINT DISCOLORED AND BADLY FLAKING AND ALLIGATORED	O/P	48	960	120	1080
A		X					REPLACE 400 SF ASPHALT FLOOR TILES RMS 18, 20, 21, 22 WORN AND BROKEN IN VARIOUS PLACES	O/C	32	640	240	880
D						X	REPLACE BUILT-UP ROOF FLASHING INCLUDING GRAVEL STOPS, SURFACE DETERIORATION EVIDENT MANY LEAKS THROUGHOUT THE YEARS (CONTRACT REQ'D)	C	–	–	–	250K
							* SPECIAL PROJECT *					

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTINGS

Date 11-06-91

Facility Number N-23

Inspector B. WHEAT

Page 1 of 1

Inspection Time 2.5 HRS

Type Inspection: S E [X] O

PKG	E	1	2	3	4	5	DEFICIENCY DESCRIPTION	W/C	LAB HRS.	LAB COST	MATL COST	TOTAL COST
C			X				REPLACE (2) DETERIORATED CONDENSING COILS ON ROOFTOP 10TON UNITS	23	32	640	1000	1640
B		X					REPLACE (3) EXHAUST VENTILATORS ON ROOF MISSING COVERS OVER BLOWER, FAN BLADES BENT	21	8	160	300	460
C			X				REPLACE (6) CRACKED PORCELAIN WASH BASINS MEN'S HEAD 1ST FLOOR	12	24	480	240	720
A		X					REPLACE SEWER LINE FROM HEADS TO MAIN CONNECTION UNDER BLDG, NUMEROUS STOPPAGES	12	16	320	60	380

Exhibit-3

FACILITY CONDITION REPORT DETAILED DEFICIENCY LISTINGS

Date 11-06-91

Facility Number N-23

Inspector B. WAINWRIGHT

Page 1 of 1

Inspection Time 2.0 HRS

Type Inspection: S [X] E M O

PKG	E	1	2	3	4	5	DEFICIENCY DESCRIPTION	W/C	LAB HRS.	LAB COST	MATL COST	TOTAL COST
B		X					REPLACE (2) 100A, 60CYCLE, 1 PHASE PANELS IN HALL, OVERLOADED (24 CIRCUIT)	21	8	160	200	360
B		X					REPLACE (6) BROKEN PERIMETER LIGHTING FIXTURES LOCATED ON NORTH & SOUTH ENDS OF BLDG	21	8	160	240	400
C				X			REPLACE APPROX 100' OF 1/2" EMT ABOVE CEILING RMS 12, 13, RUSTY AND DETERIORATED	21	16	320	100	420

APPENDIX F

MAINTENANCE PLANNING
(MAINTENANCE ACTION PLAN - MAP)

The Maintenance Action Plan (MAP) is a list of high priority Minor and Specific type work that is to be accomplished, either in-house or by contract.

MAINTENANCE PLANNING
(MAINTENANCE ACTION PLAN - MAP)

I. INTRODUCTION

The Maintenance Action Plan (MAP) is a list of high priority Minor and Specific type work that is to be accomplished, either in-house or by contract within resources available. It is a resources execution tool that should be prepared in the spring (NAVCOMPT/APPORTIONMENT) for the following fiscal year (FY). The MAP is part of the overall MAP Maintenance Plan that includes a plan to accomplish specific high priority items of maintenance and repair (M & R) work. The MAP is comprised of individual critical maintenance and repair (CMAR) items selected from a current update of the Annual Inspection Summary (AIS). CMAR items have the highest priority and should be selected from Investment Categories (IC) of greatest importance to the Major Claimant and the activity. Detailed guidance for preparation of the AIS can be found in the OPNAV Instruction 11010.34 series.

II. DETERMINING MINOR AND SPECIFIC RESOURCES

The first step in M&R budgeting and planning is to identify FA/M1 budget "requirement." This consists of determining the amount of valid resource needs for recurring work such as Emergency/Service (E/S), Standing Job Orders (SJO), repetitive contracts, Maintenance Shop and Facilities Management Engineering Division (FMED) overhead support and non-recurring work such as Minor and Specific Jobs generated from AIS Deficiency Code (DC) - one (1) items. Part "A" of Exhibit-1 contains a format for M&R "requirements" identification.

Once determined, the next step is to carefully reduce "requirements" to what you must live with in terms of actual funds available, i.e., the assigned FA/M1 dollar control. Generally, fixed items such as E/S, SJOs, and overhead support can't be reduced below a certain acceptable level. Flexibility nearly always must come from the amount of available funds that can be realistically allotted to Minor and Specific work, i.e., DC-1 CMAR deficiencies. Note - The AIS contains deferrable DC-1 M&R deficiencies (DMAR) which are also part of "requirements" subject to funding consideration, i.e., they compete for available funds, but from a position of weakness, i.e., they're not critical. Funds remaining "after" funding fixed items is the starting point for the MAP and its development. Part "B" of Exhibit-1 contains a format for Op-plan development and final determination of that portion of Ml funds available for specific M&R items.

III. DEVELOPING A MAINTENANCE ACTION PLAN (MAP)

Once the resource amount available for Minors and Specific type M&R work has been determined, then, and only then, can a MAP be developed. Input for the MAP comes from the AIS which must first be sorted so that priority work can be quickly culled from the total AIS deficiency list.

The AIS should be sorted first by (DC) and then Investment Code (IC) and Deficiency Type (DT). This sorting process will result in all deficiencies within the Commanding Officer's funding authority being listed together in IC groupings by type of work. A sample report is provided as Exhibit-2.

The next step in MAP development is to mark the CMAR items on the AIS sorted report. This should be done within the mission essential IC's established by your Major Claimant or activity. Select the critical items within each IC that can be completed next year. The dollar value of the MAP items should equal the resources planned for Minor and Specific type work for that year unless your claimant indicates a lessor percentage is to be used. ***Some*** claimants request the MAP to be only 50% of the amount available for Minors and Specifics, reserving the balance for unplanned work that it is known will occur throughout the year, that is hopefully priority type work.

Once you have decided which maintenance and repair items to accomplish during the upcoming year (from the sorted AIS report), enter each line item onto a blank MAP report form. Exhibit-3 is a sample MAP format. Any automated spreadsheet tool may be used.

MAP items should be programmed and accomplished during the designated Fiscal Year as planned. As jobs are accomplished they should be checked off the list and a completion date and work authorization document number recorded. All MAP line items should be monitored so that their completion during the year can be assured. Try to ensure the funding allocated for specific M&R items and as many of the originally planned jobs are done. A properly executed MAP should result in CMAR backlog reduction.

M1 FY–___ BUDGET PLANNING AND EXECUTION

DESCRIPTION	PART A FY–___ TOTAL REQ'T										PART B FY–___ OP PLAN (Annual)						
	CAN	IC	No. Units	E/S	OHD	SJO	M&S	Insp Reports CMAR	Insp Reports DMAR	TOT'L	E/S	OHD	SJO	M&S	Insp Reports CMAR	Insp Reports DMAR	TOT'L
				–	–						–	–					
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E/S Less Util	7820	19	*		–	–	–	–	–			–	–	–	–	–	
E/S Util	7830	19	*		–	–	–	–	–			–	–	–	–	–	
Dismantling	7840	19		–		–	–	–	–		–		–	–	–	–	
Main Shop OH	7910	19		–		–	–	–	–		–		–	–	–	–	
MCD	7920	19		–		–	–	–	–		–		–	–	–	–	
Cons/Grds Eq	7930	19		–		–	–	–	–		–		–	–	–	–	
TOTAL DIRECT M1																	

* – Calls

Definitions:

CAN – Cost Acount Number
E/S – Emergency/Service
OHD – Overhead
M&S – Minor & Specific Work
CMAR – Critical DC–1 M&R
DMAR – Deferrable DC–1 M&R
SJO – Standing Job Orders/ Recurring Contracts
IC – Investment Category

Exhibit-1

AIS SORTED REPORT

LINE NO.	CATEGORY M R D D S	TYPE OF WORK S R E M P SP O	FAC. NO.	PROP. REC. CARD	CAT CODE	CAN	IC	DC	DT	EST. COST	PROJ. NUM.	INSP. STATUS
12			1034M	200538	11120	7330	01	1	D	400		CXXXX
5			857M	200388	13145	71K0	02	1	D	16,000		CCCCC
3			857M	200388	13145	71K0	02	1	D	2,000		
44			857M	200388	13145	71K0	02	1	D	4,000		
15			857M	200388	13145	71K0	02	1	D	47,000		
20			857M	200388	13145	71K0	02	1	D	6,000		
4			857M	200388	13145	71K0	02	1	Q	17,000		
6			857M	200388	13145	71K0	02	1	M	3,000		
1			857M	200388	13145	71K0	02	1	Q	19,000		
22			857M	200388	13145	71K0	02	1	Q	13,000		
36			857M	200388	13145	71K0	02	1	Q	16,000		
34			SLGT	200388	13145	71K0	02	1	S	2,000		CCCCX
25			SLGT	200388	13145	71K0	02	1	S	8,000		
37			848M	200252	72112	7170	15	1	M	4,000		CCXCX
27			848M	200252	72112	7170	15	1	E	50,000		
39			848M	200252	72112	7170	15	1	M	50,000		
13			848M	200252	72112	7170	15	1	S	11,000		
2			511M	200191	74023	71J0	16	1	Q	3,000		CCCCX
42			724M	200472	74040	71J0	16	1	E	2,500		CCCCX
9			887M	200405	74043	71J0	16	1	S	4,000		CCCCX
10			887M	200405	74043	71J0	16	1	E	4,200		
18			846M	200245	74064	71J0	16	1	Q	27,000		CCCCX
31			846M	200245	74064	71J0	16	1	M	26,000		
41			847M	200333	82109	7640	17	1	D	4,500		CCCCX
16			847M	200333	82109	7640	17	1	D	1,000		
28			847M	200333	82109	7640	17	1	D	1,500		
17			513M	200192	82160	7640	17	1	D	400		NNNNX
8			514	200193	84160	7640	17	1	D	300		NNNNX
43			WDIST	200129	84110	7650	17	1	D	15,000		CNNNX
7			WDIST	200129	84110	7650	17	1	D	44,000		
11			WDIST	200129	84110	7650	17	1	D	10,000		

EXHIBIT _____ FY – ___ BUDGET MAINTENANCE ACTION PLAN (MAP)

DATE _____ UIC _____

NOTE:

NON – DEFERRABLE AIS ITEMS SHOULD RECEIVE HIGHEST PRIORITY

POINT OF CONTACT _____

PHONE NUMBER _____ ORGANIZATION/COMMAND _____

PRIORITY NO.	JOB ORDER NO. /CONTRACT	AIS LINE/ INSP. RPT. NO.	FACILITY NO. or AREA	DESCRIPTION OF JOB	COST ($000.0)	COST ACCT.NO.	COMMENTS

APPENDIX G

LONG RANGE MAINTENANCE PLANNING (LRMP)

LONG RANGE MAINTENANCE PLANNING

I. INTRODUCTION

Long Range Maintenance Planning (LRMP) is a management system based on comprehensive facility inspections and accurate cost estimates. The control inspection system provides the framework for the development of the Long Range Maintenance Planning system. Both provide guidelines for systematic, in-depth documentation of maintenance and repair requirements forecasted over a multi-year planning cycle. The LRMP system of inspection not only provides for in-depth inspection but inventory of facility components and installed equipment. It also provides additional emphasis on research, summarization and analysis.

Inventory of plant and equipment is the basic foundation block of the maintenance management system. Control inspection does not emphasize the inventory phase and listing of building systems and components as LRMP does. The inventory data collected in the performance of LRMP inspections provides planning engineers with a listing of facility systems and components such as numbers of doors, windows, light fixtures, etc. The initial collection of this inventory is labor intensive.

Activities that utilize Control Inspection or Long Range Maintenance Planning inspections are in a better position to formulate funding strategies and to allocate resource dollars. The KEY is to inspect, plan, and respond to the critical mission needs and future facility requirements.

II. OBJECTIVES

A. Document unfunded deficiencies and project system failures

B. Project budget and ceiling requirements

C. Produce an Annual Inspection Summary based on valid comprehensive inspections, and a Budget plan addressing those deficiencies

D. Provide a dedicated inspection workforce

III. LRMP PROCESS

The LRMP process includes, but is not limited to, the following components:

A. Research
B. Inspection
C. Estimating
D. Analyzing
E. Summarizing
F. Evaluating
G. Prioritizing

Research is the review of facility or building folders to determine what has transpired since the last inspection. Emergency service requests, job orders, military construction and special projects including shore facility planning documents, engineering studies, and contracts are reviewed prior to inspecting the facility. Research provides the inspector with a good picture of recurring problems, and an updated status since the last inspection.

The Inspection of scheduled facilities is conducted by a team of inspectors. The inspector's on-site inspection also includes a review of installed equipment. The inspector documents equipment serial and model numbers, and notes condition and numbers of installed facility components and systems. The collection of this information is valuable when preparing special projects for equipment replacement and alteration and in preparation of preventive maintenance schedules. The initial preparation of the equipment and system inventory is time consuming. It is recommended that inspectors update facility inventories every three to five years. Planners and estimators should update equipment inventories as changes occur. Exhibit-1 provides LRMP inspection effort by type and size facility.

The Estimate to correct deficiencies is accurate within ± 10 percent. Long range maintenance planning uses estimating techniques that provide material lists and labor estimates. LRMP estimates are based on engineered performance standards.

The Inspector Analyzes inspection deficiencies using such criteria as facility age, history of repairs, existing condition and impact to mission if failure occurs. Analysis of inspection reports provides the Facility Manager a good indication of condition and helps in priority assessment. The summarization of inspection recommendations and report backup into a format for analysis provides the LINK between management and inspection.

The Evaluation of inspector recommendations are guided by repair/replacement "maintenance free" scenarios, energy efficient, and state of the art replacements.

Priority or year of accomplishment recommendations are made by the inspector using criteria compatible with published AIS guidance, i.e., OPNAV Instruction 11010.34B. Priorities assigned are:

1st year — Critical Deficiencies

Deficiencies that need to be accomplished in one year and will result in at least one of the following: loss of mission, catastrophic environmental, quality of life, or safety.

2nd and 3rd year — Deferrable Deficiencies

Deficiencies which do not display signs of imminent system failure, but rapid deterioration is evident with the system nearing the end of its life expectancy.

4th and 5th year — Deferrable Deficiencies

Deficiencies which display some deterioration. The system is functional but nearing its life expectancy within five years. Fourth and fifth year deficiencies should be re-evaluated prior to funding consideration (at least every 3 to 5 years).

IV. SYSTEM COMPARISON

A comparison of Control Inspection and Long Range Maintenance Planning is difficult because each system has it's own unique advantages. Exhibit-2, Control Inspection/Long Range Maintenance Planning Comparative Analysis, outlines significant components of each system.

V. LRMP INSTALLATION

For additional information, assistance, or installation of the Long Range Maintenance Planning system contact the nearest Public Works Center, NAVFAC Code 161, or Engineering Field Division/Engineering Field Activity (EFD/EFA).

LONG RANGE MAINTENANCE PLANNING (LRMP)
INSPECTION
TIMES

These tables include times for Physical Inspection and Report Writing. Initial Data Collection and Analyses, Travel and Cost Estimating are add-ons to times reflected. The tables are provided as a guide for preparing initial inspection schedules. During inspection performance, inspectors should record actual times for use in revising schedules.

Exhibit- 1

STRUCTURAL INSPECTIONS	LRMP FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	11.4	11.7	12.1	12.4	12.7	13.0	13.3	13.6	13.9	14.6	15.2	15.8	16.4	17.1	20.2	23.3	26.4
13xxx – Communications	11.6	12.0	12.3	12.7	13.0	13.4	13.8	14.1	14.5	15.2	15.9	16.6	17.3	18.0	21.6	25.2	28.8
14xxx – Land Operations Facilities	11.2	11.5	11.7	12.0	12.2	12.5	12.7	13.0	13.2	13.7	14.2	14.7	15.2	15.7	18.2	20.7	23.2
16xxx – Harbor & Coastal Facilities	14.4	15.5	16.5	17.6	16.7	19.8	20.9	22.0	23.1	25.2	27.4	29.6	31.8	33.9	44.8	55.7	66.5
17xxx – Training Facilities	10.8	11.1	11.4	11.7	12.0	12.3	12.6	12.8	13.1	13.7	14.3	14.9	15.5	16.1	19.0	22.0	24.9
21xxx – Maintenance Facilities	12.3	12.5	12.6	12.7	12.8	13.0	13.1	13.2	13.3	13.6	13.8	14.1	14.3	14.5	15.8	17.0	18.2
31xxx – Science Laboratories	12.2	12.6	13.0	13.4	13.8	14.2	14.6	15.0	15.4	16.2	17.0	17.8	18.6	19.4	23.4	27.4	31.4
41xxx – Liquid Fuel Storage, Bulk	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
42xxx – Ammunition Storage	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
44xxx – General Supply Buildings	13.5	13.6	13.7	13.8	13.8	13.9	14.0	14.1	14.1	14.3	14.4	14.6	14.7	14.9	15.6	16.4	17.1
61xxx – Administration Buildings	11.2	11.4	11.6	11.8	12.1	12.3	12.5	12.7	13.0	13.4	13.9	14.3	14.8	15.2	17.5	19.8	22.1
69xxx – Administrative Structures	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
71xxx – Family Housing	11.1	11.5	11.8	12.2	12.5	12.9	13.3	13.6	14.0	14.7	15.4	16.1	16.8	17.5	21.1	24.7	28.3
72xxx – Unaccompanied Personnel Hsg	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.7	13.8	14.0	14.2	14.4	14.6	14.8	15.7	16.7	17.6
73xxx – Community Facility – Personnel	11.8	11.9	12.0	12.1	12.2	12.2	12.3	12.4	12.5	12.7	12.9	13.1	13.3	13.5	14.4	15.3	16.2
74xxx – Community Facility – Morale	12.5	12.6	12.8	12.9	13.1	13.2	13.3	13.5	13.6	13.9	14.2	14.5	14.8	15.1	16.5	17.9	19.3
81xxx – Electrical Power	12.6	12.9	13.2	13.4	13.7	13.9	14.2	14.5	14.7	15.3	15.8	16.3	16.8	17.4	20.0	22.6	25.3
8xxxx – Utilities & Grounds (excludes Roads)	12.0	12.2	12.4	12.5	12.7	12.9	13.0	13.2	13.4	13.7	14.0	14.4	14.7	15.0	16.7	18.4	20.0

ELECTRICAL INSPECTIONS	LRMP FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	6.2	6.3	6.4	6.6	6.7	6.8	7.0	7.1	7.3	7.5	7.8	8.1	8.3	8.6	10.0	11.3	12.7
13xxx – Communications	7.6	7.8	8.1	8.3	8.5	8.8	9.0	9.2	9.5	10.0	10.4	10.9	11.4	11.9	14.2	16.6	19.0
14xxx – Land Operations Facilities	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7	8.1	8.5	8.9	9.3	9.7	11.7	13.7	15.7
17xxx – Training Facilities	7.7	8.1	8.4	8.8	9.1	9.5	9.9	10.2	10.6	11.3	12.0	12.7	13.4	14.1	11.7	21.3	24.9
21xxx – Maintenance Facilities	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.6	7.0	7.2	7.4	7.6	8.7	9.7	10.7
31xxx – Science Laboratories	11.7	12.3	13.0	13.6	14.2	14.9	15.5	16.2	16.8	18.1	19.4	20.7	21.9	23.2	29.6	36.0	42.5
41xxx – Liquid Fuel Storage, Bulk	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
42xxx – Ammunition Storage	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
44xxx – General Supply Buildings	6.1	6.1	6.2	6.2	6.2	6.3	6.3	6.4	6.4	6.5	6.5	6.6	6.7	6.8	7.2	7.6	8.0
61xxx – Administration Buildings	7.4	7.8	8.3	8.7	9.1	9.5	9.9	10.3	10.8	11.6	12.4	13.3	14.1	14.9	19.1	23.3	27.4
71xxx – Family Housing	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
72xxx – Unaccompanied Personnel Hsg	8.5	8.6	8.6	8.7	8.7	8.8	8.8	8.9	8.9	9.0	9.1	9.2	9.3	9.4	9.9	10.5	11.0
73xxx – Community Facility – Personnel	6.7	6.9	7.1	7.3	7.6	7.8	8.0	8.2	8.5	8.9	9.4	9.8	10.3	10.7	13.0	15.3	17.6
74xxx – Community Facility – Morale	8.3	8.5	8.6	8.7	8.8	9.0	9.1	9.2	9.3	9.6	9.8	10.0	10.3	10.5	11.8	13.0	14.2
81xxx – Electrical Power	6.4	6.9	7.5	8.0	8.5	9.1	9.6	10.1	10.7	11.8	12.8	13.9	15.0	16.1	21.4	26.8	32.2
8xxxx – Utilities & Grounds (excludes Roads)	9.6	9.7	9.8	10.0	10.1	10.2	10.4	10.5	10.6	10.9	11.1	11.4	11.7	11.9	13.2	14.6	15.9

MECHANICAL INSPECTIONS

LRMP FUNCTION
Total Estimated Inspection Hours Per Facility

CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	11.0	13.0	15.0	17.0	19.0	21.0	93.0	25.0	27.0	31.0	35.0	39.0	43.0	47.0	67.0	87.0	107.0
13xxx – Communications	7.9	8.1	8.4	8.6	8.8	9.1	9.3	9.5	9.8	10.3	10.7	11.2	11.7	12.2	14.5	16.9	19.3
14xxx – Land Operations Facilities	7.4	7.6	7.8	7.9	8.1	8.3	8.4	8.6	8.8	9.1	9.4	9.8	10.1	10.4	12.1	13.8	15.4
17xxx – Training Facilities	8.8	8.9	8.9	9.0	9.0	9.1	9.1	9.2	9.2	9.4	9.5	9.6	9.7	9.8	10.3	10.9	11.4
21xxx – Maintenance Facilities	7.8	7.9	7.9	8.0	8.0	8.1	8.1	8.2	8.2	8.3	8.4	8.5	8.6	8.7	9.2	9.7	10.3
31xxx – Science Laboratories	9.7	10.3	10.8	11.3	11.8	12.3	12.9	13.4	13.9	15.0	16.0	17.0	18.1	19.1	24.3	29.5	34.7
41xxx – Liquid Fuel Storage, Bulk	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
42xxx – Ammunition Storage	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
44xxx – General Supply Buildings	7.1	7.1	7.1	7.2	7.2	7.3	7.3	7.3	7.4	7.4	7.5	7.6	7.7	7.7	8.1	8.5	8.9
61xxx – Administration Buildings	7.5	7.9	8.3	8.7	9.2	9.6	10.0	10.4	10.9	11.7	12.6	13.4	14.3	15.1	19.4	23.6	27.9
71xxx – Family Housing	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
72xxx – Unaccompanied Personnel Hsg	9.8	9.9	10.0	10.0	10.1	10.2	10.3	10.3	10.4	10.5	10.7	10.8	11.0	11.1	11.8	12.5	13.2
73xxx – Community Facility – Personnel	8.7	8.7	8.8	8.9	9.0	9.1	9.2	9.2	9.3	9.5	9.8	9.8	10.0	10.1	11.0	11.8	12.6
74xxx – Community Facility – Morale	8.9	9.0	9.1	9.2	9.4	9.5	9.6	9.8	9.9	10.1	10.4	10.7	10.9	11.2	12.4	13.7	15.0
81xxx – Electrical Power	8.2	8.5	8.9	9.2	9.5	9.8	10.1	10.4	10.7	11.4	12.0	12.6	13.2	13.8	17.0	20.1	23.2
8xxxx – Utilities & Grounds (excludes Roads)	8.4	8.5	8.7	8.8	9.0	9.1	9.2	9.4	9.5	9.8	10.1	10.4	10.7	11.0	12.4	13.8	15.2

ASPHALT SHINGLE ROOF INSPECTIONS	LRMP FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7	2.0	2.3	2.6
13xxx – Communications	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.1	1.4	1.5	1.6	1.7	1.7	1.8	2.2	2.5	2.9
14xxx – Land Operations Facilities	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.8	2.1	2.3
16xxx – Harbor & Coastal Facilities	1.4	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.5	2.7	3.0	3.2	3.4	4.5	5.6	6.7
17xxx – Training Facilities	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.9	2.2	2.5
21xxx – Maintenance Facilities	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.6	1.7	1.8
31xxx – Science Laboratories	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.7	1.8	1.9	1.9	2.3	2.7	3.1
41xxx – Liquid Fuel Storage, Bulk	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
42xxx – Ammunition Storage	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
44xxx – General Supply Buildings	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.7
61xxx – Administration Buildings	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.8	2.0	2.2
69xxx – Administrative Structures	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
71xxx – Family Housing	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	2.1	2.5	2.8
72xxx – Unaccompanied Personnel Hsg	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.6	1.7	1.8
73xxx – Community Facility – Personnel	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.5	1.6
74xxx – Community Facility – Morale	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.6	1.8	1.9
81xxx – Electrical Power	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.7	2.0	2.3	2.5
8xxxx – Utilities & Grounds (excludes Roads)	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.7	1.8	2.0

BUILT–UP & STANDING SEAM METAL ROOF INSPECTIONS	LRMP FUNCTION Total Estimated Inspection Hours Per Facility																
CATEGORY CODE/ FACILITY TYPE	FACILITY SQUARE FOOTAGE (in thousands)																
	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	15	20	25
12xxx – Liquid Fueling/Dispensing	2.9	2.9	3.0	3.1	3.2	3.2	3.3	3.4	3.5	3.6	3.8	4.0	4.1	4.3	5.0	5.8	6.6
13xxx – Communications	2.9	3.0	3.1	3.2	3.3	3.4	3.4	3.5	3.6	3.8	4.0	4.2	4.3	4.5	5.4	6.3	7.2
14xxx – Land Operations Facilities	2.8	2.9	2.9	3.0	3.1	3.1	3.2	3.2	3.3	3.4	3.6	3.7	3.8	3.9	4.6	5.2	5.8
16xxx – Harbor & Coastal Facilities	3.6	3.9	4.1	4.4	4.7	5.0	5.2	5.5	5.8	6.3	6.9	7.4	7.9	8.5	11.2	13.9	16.6
17xxx – Training Facilities	2.7	2.8	2.8	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.6	3.7	3.9	4.0	4.8	5.5	6.2
21xxx – Maintenance Facilities	3.1	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.5	3.5	3.6	3.6	3.9	4.2	4.5
31xxx – Science Laboratories	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.1	1.3	4.5	4.7	4.9	5.9	6.9	7.9
41xxx – Liquid Fuel Storage, Bulk	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
42xxx – Ammunition Storage	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
44xxx – General Supply Buildings	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.7	3.7	3.9	4.1	4.3
61xxx – Administration Buildings	2.8	2.8	2.9	3.0	3.0	3.1	3.1	3.2	3.2	3.4	3.5	3.6	3.7	3.8	4.4	4.9	5.5
69xxx – Administrative Structures	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
71xxx – Family Housing	2.8	2.9	3.0	3.0	3.1	3.2	3.3	3.4	3.5	3.7	3.9	4.0	4.2	4.4	5.3	6.2	7.1
72xxx – Unaccompanied Personnel Hsg	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.5	3.5	3.6	3.6	3.6	3.7	3.9	4.2	4.4
73xxx – Community Facility – Personnel	2.9	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.3	3.3	3.4	3.6	3.8	4.1
74xxx – Community Facility – Morale	3.1	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.4	3.5	3.6	3.6	3.7	3.8	4.1	4.5	4.8
81xxx – Electrical Power	3.2	3.2	3.3	3.4	3.4	3.5	3.6	3.6	3.7	3.8	3.9	4.1	4.2	4.3	5.0	5.7	6.3
8xxxx – Utilities & Grounds (excludes Roads)	3.0	3.1	3.1	3.1	3.2	3.2	3.3	3.3	3.3	3.4	3.5	3.6	3.7	3.8	4.2	4.6	5.0

LONG RANGE MAINTENANCE PLANNING (LRMP)
TIME TABLE
(EXAMPLE)

Times are for inspection only. After inspection times are selected, add the following labor hours per facility.

	Structural/Rooting	Mechanical	Electrical
LRMP Data Collect	2.0 hrs	1.2 hrs	1.5 hrs
Analysis	2.2 hrs	1.2 hrs	1.3 hrs
Cost Estimate	1.9 hrs/est	1.9 hrs/est	1.9 hrs/est

Travel (based on travel zone in which the facility is located)

It must be noted, the Inspection times determined are average times and may differ due to differences in the way facilities are arranged and the variety of uses within each facility.

In determining the total square feet of a facility, look at all category codes when determining the inspection time. Additional time should be added if security clearances are required and/or escorts required.

Example: How much time will be required to accomplish a complete LRMP inspection with cost estimates in Category 61XXX? The facility is a single story facility located in Travel Zone 5 and the sum of all Category Code Square footage is 25,000 SF. Facility has built-up roof. No abnormal conditions or facility layout problems exist.

	Structural	**Mechanical**	**Electrical**	**Rooting**
1. From Tables	22.1	27.9	27.4	5.5
2. LRMP Data Collection	2.0	1.2	1.5	2.0
3. Analysis	2.2	1.2	1.3	2.2
4. Cost Estimate Prep	1.9	1.9	1.9	1.9
5. Travel				
a. Trips*	3.0	4.0	4.0	1.0
b. Time/Trip	.55	.55	.55	.55
c. Travel Tie	1.65	2.2	2.2	.55
Total LRMP (1+2+3+4+5c)	29.85	34.4	34.3 or 110.7 Hours	12.15

*Inspection Time divided by 8 hrs/day.
(l-4+5c)

Exhibit-2

CONTROL INSPECTION \ LONG RANGE MAINTENANCE PLANNING
COMPARATIVE ANALYSIS

COMPONENTS	CONTROL	LRMP	REMARKS
RESEARCH	MODERATE	EXTENSIVE	INSPECTION FOLDERS PREPARED & ANALYZED
INVENTORY	MINIMAL	EXTENSIVE	LRMP COUNTS FACILITY EQUIPMENT, SYSTEMS & MODULES
INSPECTION	MODERATE	EXTENSIVE	LRMP LABOR INTENSIVE (INVENTORY)
COST ESTIMATING	PRELIMINARY + OR - 25%	DETAILED + OR - 10%	LRMP UTILIZES PWC PKGS FOR ESTIMATING, CI USES UNIT PRICE STANDARDS
ANALYSIS	MODERATE	EXTENSIVE	CI UTILIZES PACKAGING (APPENDIX E)
SUMMARIZATION	MINIMAL	EXTENSIVE	LRMP REQUIRES SUMMARIZATION INPUT REPORT
EVALUATION	MODERATE	EXTENSIVE	LRMP ALLOWS INSPECTOR EVALUATION AND REPORT
PRIORITIZATION	5 YEAR PRIORITY	5 YEAR PRIORITY	SAME
TRAINING REQUIRED	1 WEEK FORMAL. TRADE BACK-GROUND REQUIRED	6 WEEK FORMAL. TRADE BACK-GROUND REQUIRED	LRMP MORE IN-DEPTH TRAINING REQUIRED
HEALTH AND SAFETY REQUIREMENTS	ADVISORY	PHYSICAL & RESPIRATOR QUALIFIED	
WORK MANAGEMENT INTERFACE	YES	NO	LRMP DOES NOT INCLUDE WORK REQUESTS IN AIS
PRIORITY UPDATES	UPON RE-INSPECTION	AUTOMATIC PRE-PROGRAMMED	LRMP PROGRAM AUTOMATICALLY UPDATES PRIORITY, RE-INSPECTION NOT DONE
COMPUTER REQUIRED	NO, BUT CAN BE INPUT IF REQUIRED	YES	LRMP NOT INTENDED FOR MANUAL OPERATION
SOFTWARE INTERFACE	BEST/PWMA	MICRO-COMP (D) BASED STAND ALONE	LRMP INTERFACE USES COMMERCIAL PACKAGES SUCH AS WPERF, HGRAPH, TIMELINE

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