OMSI MANUALS GUIDE
06/02

I. General Requirements

The Contractor's Architect/Engineer Designer of Record (AEDOR) and design team develops the OMSI Manuals.

1. Manual Description
   The OMSI Manuals contain detailed as-built information that describes the efficient, economical and safe operation, maintenance, and repair of the facility. The OMSI Manuals are to be factual, concise, comprehensive and written to be easily used by operating and maintenance personnel. Descriptive material and theory must include technical details that are essential for a comprehensive understanding of the operation, maintenance and repair of the actual products, equipment and systems built into the facility. The AEDOR shall ensure that changes to products, equipment and systems made during construction are reflected in the Manual.

2. Organization
   Prepare the OMSI Manual in three Parts:

   - Part I - Facility Information
   - Part II - Primary Systems Information
   - Part III - Product Data.

   Cross-referencing within or between OMSI Parts or volumes is required and must be specific.

3. Sources Of Data
   The primary sources of data required to prepare the OMSI manuals include the design drawings and specifications and the accepted construction submittals. Construction submittals include, but are not limited to, Operational and Maintenance (O&M) Data, Manufacturer's Catalog Data, and Shop Drawings. The contractor's construction team furnishes these submittals to comply with the requirements of the specifications. Remove extraneous design information from plans to be included in the OMSI manuals.

4. Metric Manuals
   Projects designed with metric units of measurement require metric OMSI manuals. Show all measurements and units in metric OMSI manuals in SI (System International) metric units exclusively.

II. Format

1. Preface
   Insert a Preface as the first page in each Manual volume. The Preface shall read as indicated below:

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   PREFACE

   INTRODUCTION

   Operation and Maintenance Support Information (OMSI) was prepared for this project to help you operate, maintain, and repair the facility over its life cycle. OMSI manuals provide a comprehensive, organized library of as-built materials, equipment and systems. Use the OMSI manuals as the first step in solving your operation, maintenance or repair problems. Your comments or suggestions are welcome and should be forwarded to:

   Commander
   Southwest Division Naval Facilities Engineering Command
   Attn: Code 03CN
   1220 Pacific Highway
   San Diego, California 92132
   Telephone 619-532-3295

   CONTENTS

   OMSI Part I - Facility Information:

   This portion of the OMSI manuals contains Basic User Information needed on a daily basis by the owner or tenant of the facility. Examples include: General Facility and System Descriptions, Utility Connection and Cut-off Plans, Safety Hazards, Warranty Information. Part I - Facility Information also provides the information you need to quickly prepare Maintenance Service Contracts and Performance Work Statements for O&M and Custodial Service Contracts. Examples of this information include: area totals for floor coverings, wall and ceiling surfaces; number, types, and sizes of lighting fixtures, bathroom fixtures, windows and HVAC filters.

   OMSI Part II - Primary Systems Information:

   This portion of the OMSI manuals provides detailed operation, preventive maintenance, repair, and manufacturer's data for each system selected. This information includes items such as normal and emergency operating procedures, flow diagrams, PM requirements, spare parts, troubleshooting,

repair procedures, and warranty provisions. You can expect better Preventive Maintenance, faster repairs, and reduced down time by using information in this part of the OMSI manuals.

OMSI Part III - Product Data:

This portion of the OMSI manuals consists of construction contractor submittals for as-built materials and equipment such as manufacturer's catalog data, shop drawings, test data, and Operation and Maintenance Data not included in Part II. Part III is organized by systems. For example, if you wanted to find information about sprinkler system alarm valves, you would look under the tab for the sprinkler system. This allows you to quickly identify the exact product installed, part number, manufacturer, etc. Part III also includes architectural product information for items such as ceiling tile, carpeting, plumbing, and lighting fixtures. This information will keep your facility looking sharp for many years through product-specific maintenance and replacement of its architectural features.

UPDATING

The OMSI manuals must reflect the facility's existing components; therefore, you must continually update the manuals. When equipment or components are replaced, add pertinent new information to each manual set. Be sure to update all sections of the OMSI manuals that reference the replaced item. Purge all information on the replaced item to prevent confusion. You have been provided with copies of the electronic files used to produce these manuals. It is strongly recommended that these files be updated so that both the printed manuals and the electronic manuals are kept up-to-date together.

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2. Table of Contents
   Provide a Master Table of Contents for the entire set of OMSI manuals. Place a Master Table of Contents after the Preface page in each volume. Provide a specific Table of Contents for Part I, Facility Information; for each system in Part II, Primary Systems Information; and for each system and equipment grouping in Part III, Product Data.

III. OMSI Part I-Facility Information

Below is the list of information that may be found under Part I: Some items may not apply on a project.

1. General Facility and Systems Descriptions
   Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundation type, expected number of occupants, and facility category code. List and generally describe all the facility systems

addressed in Part II, Primary Systems Information and any special building features (such as cranes, elevators, and generators). Include photographs, marked up and labeled to show key operating components and the overall facility appearance.

2. Basis of Design
   Include the Basis of Design in narrative form that shows the basic design scope of work, assumptions and intentions of the design.

3. Safety Hazards
   List all residual hazards identified in the "Requirements Hazard Analysis". Provide recommended safeguards for each identified hazard.

4. Floor Plans
   Provide uncluttered, legible 275 by 425 mm floor plans. Exact copies of the design drawings are not acceptable. Include room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include construction instructions, references, or frame numbers.

5. Site Plans and Utility Connection and Cutoff Plans
   Provide uncluttered, legible 275 by 425 mm site and floor plans. On the utility site plans and floor plans indicate the main interior and exterior connection and cutoff points for all utilities. Include sufficient information to enable someone unfamiliar with the facility to locate the connection and cutoff points. Indicate the room number, panel number, circuit breaker, valve number, etc., for each connection and cutoff point, and what that connection or cutoff point controls. Do not include items such as contour lines, elevations, and subsurface information on the site plans. These plans shall be in addition to the "Floor Plans" required above.

6. Extended Warranty Information
   List all warranties for products, equipment, components, and subcomponents whose duration exceeds one year. Cross-reference the list to the warranty copies included in Part II, Primary Systems Information or in Part III, Product Data. For each warranty listed indicate duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference all specific operation and maintenance procedures that must be performed to keep the warranty valid.

7. Equipment Inventory
   Provide an equipment inventory that includes item descriptions, locations, model numbers and the names, addresses, and telephone numbers of the manufacturers, suppliers, contractors, and subcontractors. Limit the equipment inventory to major components such as shown on the design drawings equipment schedules.

8. HVAC Filters
   Provide a table that lists the quantity, type, size, and location of each HVAC filter.

9. Floor Coverings
   Provide a table that lists by room number (including corridors and common spaces), the type of space, the type of floor covering and area of floor. The table shall include a facility summary of the total area for each type of space and floor covering.

10. Wall Surfaces
    Provide a table that lists by room number (including corridors and common spaces), the type of wall surface, and area of wall surface. The table shall include a facility summary of the total area for each type of wall surface.

11. Ceiling Surfaces
    Provide a table that lists by room number (including corridors and common spaces), the type of ceiling surface, and area of ceiling surface. The table shall include a facility summary of the total area for each type of ceiling surface.

12. Windows
    Provide a table that lists by room number (including corridors and common spaces), the type of window, window size, number of each size and type, and special features. The table shall include a facility summary of the total number for each type and size of window.

13. Lighting Fixtures
    Provide a table that lists by room number (including corridors and common spaces), the type of lighting fixture, number of lighting fixtures, type of bulbs or tubes, and number of bulbs and tubes. The table shall include a facility summary of the total number of fixtures of each type and number of bulbs or tubes of each type.

14. Bathroom And Plumbing Fixtures
    Provide a table that lists by room number, the number and type of plumbing and bathroom plumbing fixtures (e.g., sinks, water closets, urinals, showers and drinking fountains).

15. Roofing
    Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system; manufacturer's, supplier's, and installer's names, addresses, and phone numbers. For each type of roof, provide a recommended inspection, maintenance and repair schedule that details checkpoints, frequencies, and prohibited practices. List roof structural load limits.

16. Supply Inventory Requirements
    Provide a list of maintenance and repair supplies (e.g., spare parts, fuels, lubricants, etc.) required to ensure continued operation without unreasonable delays. Identify and list parts and supplies that have long lead purchase time. Give special consideration to facilities at remote locations.

17. As-Built Drawing List
    Provide a list of the as-built drawings. Include NAVFAC drawing number and title. Identify where the drawings and project specifications will be filed.

18. Training Requirements
    Provide a list of recommended training related to the operation, maintenance and repair of each installed system that is available from the manufacturer or other source. Provide the name, address, and phone number of point of contact. The training requirements shall pertain only to systems addressed in Part II, Primary Systems Information.

19. Skill Matrix
    Provide a matrix by system and skill that identifies productive hours required to maintain the facility's systems addressed in Part II, Primary Systems Information. An example of the format follows.

	Hours	System 1	System 2	System 3	Total/Skill
Skill 1					
Skill 2					
Skill 3					
Skill 4					
Total/System					

IV. OMSI Part II - Primary Systems Information

1. Systems
   Prepare the information required for Part II, Primary Systems Information using a systems approach. This approach requires that consideration be given to the entire system (that is, the interfaces of equipment, connections and material flow within the system). Include the following applicable systems:

   a. HVAC System and Controls
   b. Domestic Water Heating System
   c. Fire Alarm System
   d. Fire Suppression System
   e. Elevators
   f. Emergency Power Systems
   g. Compressed Air Systems (Shop or breathing air)
   h. Industrial Ventilation

i. Ship Utility Hook ups
j. Aircraft Fuel Systems
k. Wastewater Treatment Systems

2. Notes, Cautions and Warnings
Use Notes, Cautions and Warnings throughout Part II, Primary Systems Information to emphasize important and critical instructions and procedures. Place Notes, Cautions and Warnings immediately before the applicable instructions or procedures. Notes, Cautions and Warnings are defined as follows:

a. **Note:** Highlights an essential operating or maintenance procedure, condition or statement.

b. **Caution:** Highlights an operating or maintenance procedure, practice, or condition, statement, etc., that, if not strictly observed, could result in damage to or destruction of equipment, loss of mission effectiveness, or health hazards to personnel.

c. **Warning:** Highlights an operating or maintenance procedure, practice, condition, or statement, etc., that, if not strictly observed, could result in injury to or death of personnel.

3. Operation

a. System Description: Provide a detailed discussion of the system composition and operation. Include technical details that are essential for an understanding of the system.

b. Start-Up and Shutdown Procedures: Provide step-by-step instructions to bring systems from static to operational configurations and from operating to shutdown status.

c. Normal Operating Instructions: Provide a discussion of the normal operation and control of the system. Address operating norms (e.g., temperatures, pressures, and flow rates) expected at each zone or phase of the system. Supplement the discussion with control and wiring diagrams and data.

d. Emergency Operating Instructions: Provide emergency operating procedures in the event of equipment malfunctions. Provide shutdown instructions for fires, explosions, spills, or other contingencies.

e. System Flow Diagrams: Provide a flow diagram indicating system liquid, air (do not include ductwork) or gas flow during normal operations. Integrate all system components into the diagram. A

compilation of non-integrated, flow diagrams for the individual system components are not acceptable.

f. Diagrammatic Plans: Provide floor plans indicating the location of equipment and configuration of the system installation. Include the configuration of associated piping or wiring. Subordinate structural features to utility features.

g. Environmental Considerations: Provide a listing of the equipment that requires special operation, reporting, testing, analysis or inspection to comply with federal, state or local environmental laws. Examples of possible list items include back flow preventer inspections, underground storage tank testing, hazardous material or waste usage and storage documentation, and air pollution control devices. Each item in the list shall include requirements for environmental operation, reporting, testing, analysis and inspection as well as references to respective implementing regulations, statutes, or policies.

h. Operator Servicing Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.

i. Safety Instructions: Provide a list of all personnel hazards and equipment safety precautions including recommended safeguards.

j. Valve List: Provide a list of all valves associated with the system. Show valve type, identification number, function, location and normal operating position.

k. Operating Log: Provide forms, samples, and instructions for keeping necessary operating records.

4. Preventive Maintenance

a. Preventive Maintenance Plan and Schedule: Provide a Preventive Maintenance (PM) plan using manufacturer's recommendations and sound engineering practice. Include all major pieces of equipment. Provide a check sheet that details maintenance tasks and associated frequencies. Also provide an annual schedule indicating when maintenance tasks should be performed such that work is spread as evenly as possible throughout the year.

b. Preventive Maintenance Procedures: Provide a Task Card for each individual maintenance task identified on the PM Plan and Schedule. Include detailed PM procedures, safety instructions and precautions including Lock Out/Tag Out precautions, required skill level, number

of personnel needed, frequency, special tools needed, parts needed, and estimated time required to complete the task.

c. Lubrication Schedule: Provide a lubrication schedule indicating types, grades, and capacities of lubricants for specific temperature ranges and applications.

d. Preventive Maintenance Log: Provide a tabular form for recording the accomplishment of PM. Log shall record date PM was performed, findings, action taken, parts used, time required to complete the work, and other data necessary to provide a good historical record of PM activities.

5. Repair

a. Troubleshooting Guides and Diagnostic Techniques: Provide step-by-step procedures for isolating the cause of system malfunctions. The procedures shall clearly state indications or symptoms of trouble; the sequential instructions, including checks and tests to be performed and conditions to be sought, to determine the cause; and remedial measures to bring the equipment and system to operating condition. Identify special test equipment required to perform the procedures. Start the troubleshooting guide at the system level and proceed to a level where detailed manufacturer's troubleshooting procedures for equipment and components can be referenced.

b. Repair Procedures: Provide repair instructions required to restore equipment to proper operating standards. References shall be specific as to location within the OMSI manuals.

c. Removal and Replacement Instructions: Provide or refer to the manufacturer's data for the instructions on the removal and replacement of equipment components. References shall be specific as to location within the OMSI manuals.

6. Manufacturer's Data

a. Operation and Maintenance Data: Include the O&M Data Package information required for the equipment and systems specified in the technical sections. Incorporate this information into each system discussion under the Operation, Preventive Maintenance and Repair sections of Part II - Primary Systems Information.

b. Manufacturer's Equipment Information: Provide drawings, illustrations and technical data furnished by the manufacturer for the equipment

and system components. Organize and index the information for easy reference.

V. OMSI Part III - Product Data

1. Record Of Material And Equipment
   Provide a record of materials and equipment used in the facility construction. Include Product Data required in the project specifications. Examples of Product Data include manufacturer's catalog data, instructions, test reports and warranties. Include shop drawings relevant to the operation and maintenance of the facility or system except those used in Part II, Primary Systems Information. Do not include extraneous data (e.g., transmittal sheets, certifications, welder qualifications, contractor qualifications and certificates of compliance). Highlight or note submittals that contain information for several parts or model numbers to identify installed material. Product data included in Part III; Product Data shall use metric units if metric OMSI manuals are required. Conversion to metric units is not required for product data that contains only English units.

2. Written Warranties
   Provide copies of extended equipment warranties.