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NAVFACINST 11013.39B
NAVFAC NPW
14 September 2000

From: Commander, Naval Facilities Engineering Command

Subj: OPERATION AND MAINTENANCE SUPPORT INFORMATION (OMSI) FOR FACILITY PROJECTS

Ref: (a) DOD 4270.1-M Policy Guidelines for Installation Planning, Design, Construction and Upkeep of 11 Feb 87

Encl: (1) OMSI Policies and Procedures
(2) OMSI Scope of Work (generic)

1. Purpose. To implement the policies and procedures for the application of the Operation and Maintenance Support Information (OMSI) Program to the acquisition of facilities constructed under the cognizance of the Commander, Naval Facilities Engineering Command (NAVFAC). This instruction implements reference (a).

2. Cancellation. NAVFACINST 11013.39A of 6 July 1990

3. Discussion. Facilities have complex operating systems. Comprehensive and well-organized Operation and Maintenance (O&M) information is critical to ensure that a facility functions as designed, is safe, and continues to meet mission requirements over its life cycle. As-built product information is also needed to maintain, repair, and replace the hundreds of architectural products found within a facility. OMSI minimizes facility O&M costs and promotes good stewardship. With OMSI, O&M work is completed faster, warranties are protected, and the facility remains functional and sharp. OMSI is provided at construction completion in the form of comprehensive O&M manuals, compact discs or other electronic formats, and databases that can be used alone or incorporated directly into a Computerized Maintenance Management System.

4. Scope. OMSI should be provided, as practicable, for all Military Construction (MILCON) and O&M-funded construction, alteration, modernization, and repair projects administered by NAVFAC and its field activities. For Non Appropriated Fund and reimbursable projects, clients should be encouraged to fund OMSI.

5. Policy. NAVFAC shall provide an OMSI product for most facility projects prior to beneficial occupancy. Provision of OMSI should become a routine and automatic part of the facility planning and acquisition processes. Enclosure (1) contains procedural guidance for program implementation. Enclosure (2) provides a generic OMSI scope of work that may be modified as required for a specific project. The latest version of this scope can be downloaded from ftp://www.efdlant.navfac.navy.mil/downl/Lantops_16/AE/OMSI.doc

6. Action. Commanders/Commanding Officers of Engineering Field Divisions and Activities shall:

(a) Assist Major Claimants, Regional Commanders, and their installations in assessing and budgeting OMSI requirements for facility projects.

(b) Implement a program for incorporating OMSI in design and construction of facility projects.

(c) Prepare the OMSI scopes of work and fee estimates; coordinate the negotiation and award of OMSI; and review and accept OMSI deliverables.

(d) Issue local implementing instructions as necessary.

M. K. LOOSE
Vice Commander

Distribution: See next page

Distribution: (1 each)

SNDL :

21A	FE4	FFN2	FM1
23C3	FF1	FN1	FT2
A2A	FF3	FR3	FT31
A3	FF18	FR4	FT85
A6	FF32	FR9	FKR1B
E3A	FF38	FS1	FL1
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OMSI POLICIES AND PROCEDURES

A. GENERAL POLICY. It is the policy of the Naval Facilities Engineering Command (NAVFAC) to provide an Operation and Maintenance Support Information (OMSI) package for most facility projects. Exceptions generally include horizontal construction such as paving, grading, dredging and small projects ($500K or less). OMSI may not be required on projects below $500K; however, the need should be evaluated. OMSI encompasses MILCON and non-MILCON construction, alteration, modernization, and repair.

B. PRINCIPLE. The premise behind the OMSI concept is threefold.

1. It promotes early consideration of facility reliability and maintainability during the acquisition process by requiring the designer, owner, and builder to identify the requirements for safe and effective operation, maintenance and repair of the facility.

2. It provides a framework and mechanism for capturing key information produced during the design, construction, and final acceptance phases of a project. This is critical to the life cycle support of the facility. Complex systems are identified and given special treatment to ensure their safe and effective operation.

3. It ensures that our client receives a complete and accurate package of as-built support information at project completion. This package is in hard copy or disc format and is user-friendly and lasting.

Enclosure (1)

C. OMSI ELEMENTS. A comprehensive OMSI package may include the following elements:

1. Staffing and Budgeting - Manpower requirements for O&M trade classification. Estimated costs to operate and maintain the facility.

2. Supply Support - Requirements for critical spare parts, repair parts, fuels and lubricants which reflect special consideration of facility mission and location. Lists of parts and supplies that have an unusually long procurement lead-time.

3. Operating Procedures - Step-by-step instructions to bring systems from static to operational configurations and from operating to shutdown status. These instructions include both normal and emergency operating conditions.

4. O&M Indoctrination - On-site familiarization, instruction and guidance by the A-E, contractor and/or manufacturer, to adequately indoctrinate personnel who will be responsible for O&M of the facility.
NOTE: When the OMSI package is funded with MILCON and if significant on-site training will be required, the training requirement should be identified in the Project Documentation, DD Form 1391.

5. Basic Data for Facility Support Contracts/Performance Work Statement (FSC/PWS) - Basic information needed to prepare a PWS for any operation and/or maintenance requirement that will be accomplished under contract rather than by station forces.

6. Troubleshooting Guides and Diagnostic Techniques - Trouble-shooting procedures to promptly isolate the cause of typical system malfunctions. Documentation of specialized test equipment needed to diagnose malfunctions and techniques for use of the equipment.

7. Extended Warranty Information - Table of equipment and components that have extended warranties and the associated manufacturer's name, address, phone and email address.

8. Maintenance Planning Documentation - Lubrication schedules, maintenance requirements, special tools, and safety precautions.

9. Work Control Documentation - Procedures and formats for scheduling, monitoring, controlling and documenting both preventive and corrective maintenance actions.

10. Technical Data - Design loads, design calculations, reserve capacities, one-line diagrams, logic diagrams, critical tolerances, base-line performance data, vibration signatures, etc.

11. Repair Procedures - Repair instructions required to restore equipment and systems to proper operating condition. Where necessary, removal and replacement instructions.

12. Manufacturer's Product Data - Drawings, illustrations, catalog cuts, equipment listings and product technical data furnished by the manufacturer.

13. Documentation - Compilation of specialized information, such as: force protection features, total building commissioning plan, sustainable design features, reliability centered maintenance features, and environmental considerations.

D. OMSI MANUALS. OMSI Manuals are normally organized into three parts. OMSI Part I, Facility Information, OMSI Part II, Primary Systems Information, and OMSI Part III, Product Data. The OMSI scope should be tailored to the project, e.g. a fuel tank and piping project would eliminate most of the Part I structural items. Depending on the project and funding limitations, the deliverable OMSI may include some or all of the following OMSI elements.

1. OMSI Part I, Facility Information. This portion of the OMSI Manuals contains the basic 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 and warranty information. Also included in this portion of the manuals is the detailed information needed to quickly prepare Facility Service Contracts (FSC) and Performance Work Statements (PWS) 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 luminaries, lamps, bathroom fixtures, windows and HVAC filters.

2. OMSI Part II, Primary Systems Information. This portion of the OMSI Manuals provides detailed operation, preventive maintenance, repair and manufacturer's O&M data for selected systems. This information includes normal and emergency operating procedures, flow diagrams, Preventive Maintenance (PM) requirements, spare parts, troubleshooting, repair procedures and warranty provisions. Considering all data, the A-E makes realistic recommendations as to PM frequency and priority. Systems typically included are Heating, Ventilation and Air Conditioning (HVAC), Direct Digital Controls (DDC), emergency power and fire protection. Complex facilities (e.g., hospitals, power plants, plating shops or water/wastewater treatment plants) may include fifteen or more systems, while less complex facilities (e.g. administrative buildings, piers and wharves, or bachelor quarters) may include only two or three systems. Faster repairs, reduced down time, and more effective preventive maintenance will result from using information in this part of the manuals.

3. OMSI PART III, Product Data. This portion of the OMSI Manual provides a record of the as-built products, materials and equipment used in the facility's construction. This includes manufacturer's product data submittals as required by division eight through sixteen of the construction specifications. Examples of product data include manufacturer's catalog data, data sheets, test reports and warranty sheets. Also included are any shop drawings relevant to the O&M of the facility's systems.

The data in Part III is organized by the divisions and sections of the construction specifications for quickly locating the exact product installed. Part III also includes architectural items such as ceiling tile, carpeting, lavatory accessories and lighting fixtures. Often overlooked in importance, the use of this information will help keep a facility looking sharp for many years through product-specific maintenance and replacement of its architectural features.

E. DOCUMENTATION.

1. MILCON and Special Projects. OMSI should be referred to as "Technical Operating Manuals" when shown on project documentation. OMSI requirements and costs shall be indicated as a separate line item in Block 9 (Cost Estimates, DD Form 1391) when the OMSI cost is $50,000 or

greater. If the OMSI cost is less than $50,000, the requirement shall be entered in Block 10 (Description of proposed construction, DD Form 1391) with the cost included as part of the Primary Building Cost on the Unit Cost Development Sheet. Training, if desired, shall also be identified in project documentation.

2. NAF and Reimbursable Projects. Identify the requirement and costs for OMSI products on either a Purchase Order (PO) or a Request for Contractual Procurement (RCP) or, for inter-service projects, on a Military Interdepartmental Purchase Request (MIPR).

F. FUNDING.

1. Military Construction (MILCON) and Military Construction Naval Reserve (MCNR) Projects. In-house and A/E support for OMSI development before construction award shall be charged to MILCON Planning and Design funds. After construction award, the cost shall be charged to project (construction) funds.

2. Non-MILCON Projects. In-house and A/E support shall be charged to funds provided by the customer (activity or major claimant). For O&MN funded Special Projects, OMSI will be treated as an unfunded project cost that does not apply to project statutory limits.

G. ESTIMATING. The cost of OMSI is based primarily on the complexity of the project and the construction cost.

1. **Table 1** lists examples of facilities that would usually be classified as Complex OMSI. In most cases, these facilities will have *more than three systems* included in OMSI Part II, Primary Systems Information.

2. **Table 2** lists examples of projects usually classified as Non-Complex OMSI. These projects normally will have *three or less systems* included in OMSI Part II.

3. **Table 3** lists examples of projects that *do not* usually require OMSI.

4. **Table 4** lists examples of typical systems normally included in OMSI Part II, Primary Systems Information. Note that this table is to be used as a preliminary guideline and

should be adjusted as the project documentation and designs are finalized, possibly adding additional systems.

Table 1

Examples of Facilities Usually Classified as a Complex OMSI (more than three systems in Part II)

FACILITY TYPE	BASIC CATEGORY CODE
Petroleum, Oil & Lubricant (POL) Facilities	120
Computer Operations Center (Large/Complex)	143
Training Facilities with Complex Systems	171
Aircraft Maintenance Shops	211
Missile Assembly & Maintenance Shops	212
Ship Maintenance Shops	213
Laboratories	310
Liquid Fuel Storage - Bulk	411
Central Refrigeration Plants	431 & 826
Medical Facilities	500
Power Plants (750 KW and Larger)	811
Heating Plants (950 MBTUH and Larger)	821
Industrial Waste & Sewage Treatment Plants	831
Water Treatment Facilities	841
Miscellaneous Utilities	890

Table 2

Examples of Facilities Usually Classified as a Non-Complex OMSI (three or less systems in Part II)

FACILITY TYPE	BASIC CATEGORY CODE
Warehouse - General	441
Administrative Facilities	600
BEQ/BOQ	721 & 724
Community, Morale, Recreation	740
Operation & Training Facility (small/non complex)	100
Piers and Wharves	152

Table 3

Examples of Facilities Usually Not Requiring OMSI

FACILITY TYPE	BASIC CATEGORY CODE
Airfield Pavement/Taxiways/Aprons	110-116
Dredging	165
Open Storage	451
Roads and Streets/Pavements	850/851

Table 4

Typical Systems Included in OMSI Part II, Primary Systems Information

1. HVAC	21. Compressed Air/Vacuum
2. Industrial Ventilation/Filtration	22. Pneumatic Tube
3. Cooling Tower Water Treatment	23. Blast Doors with Control/Monitor
4. Steam/Hot Water Boiler	24. Control Monitor and Alarm
5. Steam Turbine/Generator	25. Emergency Lighting
6. Direct Digital Control	26. Intrusion Detection
7. Space Temperature Controls	27. Radio Paging
8. Carbon Dioxide (CO 2)	28. Switchgear and Wiring
9. Underflow Fire Suppression	29. Aircraft Refueling
10. Fire Alarm	30. Bulk Fuel Storage/Transfer
11. Fire Suppression (Wet/Dry Pipe/Foam)	31. Water Treatment
12. Medical Gas	32. Waste Water Treatment
13. Nurse Call	33. Storage/Supply Retrieval
14. Medical Public Address	34. Pier Utilities Distribution
15. Medical Pure Water	35. Diesel Electric Generator
16. Medical Waste Handling	36. Uninterruptable Power
17. Medical Waste Incinerator	37. Special Power (400hz)
18. Medical Case Cart Transport	38. Special Conveyors/Hoists
19. Emissions Monitoring	39. HEMP Shielding
20. Enviro. Remediation (Pump & Treat)	40. Cathodic Protection

NOTES:

1. List is not inclusive; rather, it represents a sample of project systems that may be included in Part II of the OMSI.

2. Some systems will have one or more subsystems, which may be included separately in Part II of the OMSI. For example, water treatment may be broken down into the systems of aeration, screening, flocculation and chlorination.

5. OMSI Estimate. In estimating the cost of OMSI for a specific project, use the best available information. If a good basis to make the estimate does not exist, Table 5 should be used for a budget or preliminary estimate based upon a percentage of the primary construction cost plus applicable supporting facility costs from DD Form 1391 or construction estimate. If OMSI is required for the supporting facilities (such as utilities), add these costs to the primary facility costs before calculating the OMSI estimate. The percentage selected (within the ranges shown) should be based on the relative complexity of the facility and the number of specific systems to be covered in Part II of the OMSI Manuals. See DOCUMENTATION, paragraph E(1), for proper placement of the OMSI cost estimate on the DD Form 1391.

Table 5

Examples of OMSI Cost for Budget or Preliminary Estimates

Primary plus Applicable Supporting Facilities Costs	OMSI Cost	
	Complex	Non-Complex
Below $5.000,000	1.50 - 2.50%	0.50 - 1.50%
$5,000,000 to $20,000,000	1.25 - 2.00%	0.75 - 1.25%
$20,000,000 to $50,000,000	0.95 - 1.85%	0.50 - 1.10%
Above $50,000,000	0.50 - 1.20%	0.25 - 0.70%

NOTES:

1. Table 5 shows estimated cost of OMSI as a percentage range of the total of primary facility construction cost plus applicable supporting facility costs.

2. Use the higher range for more complex projects. For example, an industrial waste treatment plant with an $18 million facility construction cost would have an estimated OMSI cost of $360,000 ($18,000,000 X 0.02).

3. For a non-complex Bachelor Quarters with a $9 million construction cost, the OMSI budget may be more appropriately estimated using the lower or middle percentage range of 0.95%. The estimated OMSI cost would be $85,500 ($9,000,000 X .0095).

4. The minimum estimate for a small complex OMSI project will be approximately $30,000.

5. The minimum estimate for a small non-complex OMSI project will be approximately $20,000.

OPERATION AND MAINTENANCE SUPPORT INFORMATION (OMSI)
SCOPE OF WORK

Contract Title/Location: **Preparation of OMSI Manuals for: [Project Number], [Project Description], [Activity], [Location]**

OMSI A/E Contract No: **[Contract Number]**

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1. GENERAL REQUIREMENTS

a. DESCRIPTION OF MANUALS - The purpose of the work is to provide OMSI manuals that contain detailed, as-built information that describes the efficient, economical and safe operation, maintenance, and repair of the subject facility. The OMSI manuals are to be factual, concise, comprehensive and written to be easily used by operation and maintenance personnel. Descriptive matter and theory must include technical details that are essential for a comprehensive understanding of the operation, maintenance and repair of the system. The OMSI Architect and Engineer (A/E) shall ensure that OMSI manuals reflect changes to systems and equipment made during construction. The words *system, systems,* and *equipment,* when used in this document refer to as-built systems and equipment.

b. ORGANIZATION OF MANUALS - Prepare the OMSI manuals in three parts: Part I - Facility Information, Part II - Primary Systems Information, and Part III - Product Data. Cross referencing within or between OMSI Parts or volumes is required and must be specific.

c. SOURCES OF DATA - The primary sources of data needed to prepare the OMSI manuals include approved construction submittals, design plans and specifications, and field visits. Construction submittals include items such as Operation and Maintenance (O&M) Data, Product Data, Shop Drawings, and Field Test Reports. These submittals are generally prepared by the manufacturer or supplier of the product, component, or system and are submitted by the construction contractor or subcontractor per the specifications. Construction Specification Section 01330 lists the submittal requirements and Specification Section 01781 lists more detailed O&M requirements. Remove extraneous design information from plans to be included in the OMSI manuals. Photocopies of design plans are not acceptable.

d. METRIC MANUALS - Projects designed with metric units of measurement require metric OMSI manuals. All measurements and units shall be in SI (System International) metric units exclusively.

2. DESCRIPTION OF WORK

a. OMSI PART I - FACILITY INFORMATION

(1) General Facility and System Description - Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundations type, expected number of occupants, and facility category code. List and generally describe all the facility systems listed in Part II, Primary Systems Information and any special building features (for example, 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 that shows the basic design scope of work, assumptions and the original intentions of the A/E of design.

(3) Sustainable Design – Include a listing of the elements of sustainable design which have been incorporated into the facility.

(4) Safety Hazards - List all residual hazards identified in the Requirements Hazard Analysis as prepared by the A/E of record. Provide recommended safeguards for each identified hazard.

(5) Floor Plans - Provide uncluttered, legible 11 by 17-inch floor plans. Exact copies of the design plans are usually not acceptable because of extraneous information. Include only room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include construction instructions, references, frame numbers, etc..

(6) **Utility Connection and Cutoff Plans** - Provide utility site and floor plans that indicate the exterior and main interior connection and cutoff points for all utilities. Include enough information to enable someone unfamiliar with the facility to quickly locate the connection and cutoff points. Do not include items such as contour lines, elevations, and subsurface information on the site plans. Indicate the room number, panel number, circuit breaker, valve number, etc., of each connection and cutoff point, and what that connection or cutoff point controls. These plans are in addition to the Floor Plans.

(7) **Extended Warranty Information** - List all warranties for products, equipment, components, and sub-components 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 the applicable specification section, 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.

(8) **Equipment Listing** - Provide a table that lists the major equipment shown on the design Equipment Schedules. For each item, provide the description, location, model number and the respective name, address and telephone number of the manufacturer, supplier, contractor and subcontractor.

(9) **HVAC Filters** - Provide a table that lists the quantity, type, size and location of each HVAC filter.

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

(11) **Wall Surfaces** - Provide a table that lists by room number (including hallways and common spaces), the type of wall surface and area of wall surface. The table will include a facility summary of the total area for each type of wall surface.

(12) **Ceiling Surfaces** - Provide a table that lists by room number (including hallways and common spaces), the type of ceiling surface and area of ceiling surface. The table will include a facility summary of the total area for each type of ceiling surface.

(13) **Windows** - Provide a table that lists by room number (including hallways and common spaces), the type of window, window size, number of each size and type and special features. The table will include a facility summary of the total number for each type and size of window.

(14) **Lighting Fixtures** - Provide a table that lists by room number (including hallways 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 will include a facility summary of the total number of fixtures of each type and number of bulbs or tubes of each type.

(15) **Plumbing Fixtures** - Provide a table that lists by room number, the number and type of plumbing and bathroom plumbing fixtures (for example, sinks, water closets, urinals, showers and drinking fountains).

(16) **Roofing** - Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system with names, addresses, and phone numbers of the manufacturer, supplier, and installer. 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 and locations. Cross reference the roof warranty to the Extended Warranty Information list, Item 7.

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

(18) **As-built Drawing List** - Provide a list of the "As-Built" or "Record" drawings and specifications. Include drawing number and title. Provide the As-Built CAD drawings and specifications on Compact Disc (CD) with the Final Submittal.

(19) **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 listed in Part II, Primary Systems Information.

(20) **Skill Matrix** - Provide a matrix by system and skill that identifies productive hours required to maintain the facility's systems listed in Part II, Primary Systems Information. An example of the format is as follows:

	Hours			
Skill required	*System 1*	*System 2*	*System 3*	*Total/Skill*
Skill 1				
Skill 2				
Skill 3				
Total/System				

b. OMSI PART II - PRIMARY SYSTEMS INFORMATION

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 systems:

1. HVAC System
2. Fire Alarm System
3. Sprinkler System
4. [Other related systems as necessary]

Use **Notes, Cautions and Warnings** throughout the 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:

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

Caution: Highlights an operating or maintenance procedure, practice, 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.

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.

(1) <u>Operation</u>

(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 (for example, 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. Note that a compilation of non-integrated flow diagrams for the individual system components is 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, subordinating 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/storage documentation and air pollution control devices. For each item, include requirements for environmental operation, reporting, testing, analysis and inspection as well as references to respective implementing regulations, statutes or policies. For projects in Italy, Greece and Spain, the OMSI manuals are to include requirements needed for compliance with the environmental Final Governing Standards (FGS) for that country.

(h) **Field Test Reports** - Provide Field Test Reports (SD-12) that apply to equipment associated with the system.

(i) **Operator Servicing Requirements** - Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.

(j) **Safety Instructions** - Provide a list of all personnel hazards and equipment safety precautions including recommended safeguards.

(k) **Valve List** - Provide a list of all valves associated with the system. Show valve type, identification number, function, location and normal operating position.

(l) **Operating Log** - Provide forms, samples and instructions for keeping necessary operating records.

(2) Preventive Maintenance

(a) **Preventive Maintenance Plan and Schedule** - Provide a Preventive Maintenance (PM) plan using manufacturer's recommendations and sound engineering practice to develop reasonable guidance. Include all major pieces of equipment. Provide a table or 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 must 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.

(3) Repair

(a) **Troubleshooting Guides and Diagnostic Techniques** - Provide step- by-step procedures for diagnosing, isolating and correcting 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 the remedial measures to return 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 the system's components can be referenced.

(b) **Repair Procedures** - Provide repair instructions required for restoring equipment to proper operating condition and standards. References must 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 for the removal and replacement of equipment components. References must be specific as to location within the OMSI manuals.

(4) Manufacturer's Data

(a) **Operation and Maintenance Data** - Include the O&M Data Package information provided by the construction contractor per the technical sections of the specification and Section 01781, Operation and Maintenance Data. 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 product data furnished by the manufacturer for the equipment and system components. Organize and index the information for easy reference.

c. **OMSI PART III - PRODUCT DATA**

(1) **Record of Material and Equipment** - Provide a copy of the product data and O&M manuals used in the facility construction. Include product data submittals required in Divisions 8 through 16 of the construction specification. Examples of product data include Manufacturer's Catalog Data (SD-02), and Field Test Reports (SD-12). Include Shop Drawings relevant to the operation and maintenance of the facility or system except those already used in Part II, Primary Systems Information. O&M manuals for equipment should be included and separately tabbed within the specification section. Do not include extraneous data, (for example, transmittal sheets, certifications, welder qualifications, contractor qualifications and certificates of compliance). Highlight or note submittals that contain information on several parts or model numbers to identify the actual installed material. Product data included in Part III, Product Data should use metric units if metric OMSI manuals are required. The A/E is not required to convert to metric units in product data that contains only English units.

(2) **Warranties** - Provide copies of extended warranties for systems, equipment and components. Cross-reference the warranties to applicable divisions of the construction specifications and OMSI Part II, Primary Systems Information.

3. **FORMAT**

a. **HARD COPIES**

(1) **Binders** - Bind the OMSI manuals in durable, hard cover, water and grease resistant binders, which hold 8 1/2 by 11 inch sheets. Binders shall have clear pockets located on the front and on the spine that hold printed sheets.

(a) Facility Information binder - Bind the Part I, Facility Information in a white, post type, loose leaf binder of appropriate size.

(b) Primary Systems Information binders - Bind the Part II, Primary Systems Information in blue, post type, loose-leaf binders of three inch capacity. More than one system may be included in a single binder provided that all sections of each system are included in that binder.

(c) Product Data binders - Bind the Part III, Product Data in red, post type, loose leaf binders of three inch capacity.

(d) Identify each binder on both the cover insert sheet and the spine insert sheet with the following information.

1. OMSI Manual Part I, II or III with appropriate titles
2. Building Number
3. Project Title
4. Activity and Location
5. Construction Contract Number
6. Prepared For: [Contracting Agency]
7. Prepared By
8. Volume Number - Each binder is a single volume. Number each volume consecutively. For example, an OMSI composed of 5 binders would have the Part I, Facility Information binder labeled volume 1 of 5 and the last Part III, Product Data binder would be volume 5 of 5.

(2) **Pages, Dividers and Tabs** - Use high quality paper and dividers made of heavy duty paper with plastic reinforced holes and integrated tabs.

(a) **Facility Information divider** - Use white tabs to identify the major items.

(b) **Primary Systems Information dividers** - Use blue tabs with bold type to identify the system titles. Use dividers with white tabs to identify the different sections under each system and the major topics under each section.

(c) **Product Data dividers** - Use white tabs to show the Division 8 through 16 number and title. Use dividers with colored tabs to identify the specification section number with keywords to identify the section title. Use colored non-tab dividers to separate large equipment groupings such as valves, pumps, chillers and to separate the O&M data within each specification section.

(3) **Oversized Sheets** - Insert oversized sheets into the binders as single foldout sheets. Oversized sheets are defined as submittals, instruction sheets, drawings, etc., larger than 8 1/2 by 11 inch, but not exceeding 11 by 17-inch. Oversized sheets shall be folded to expose the sheets title block. Submittals or drawings exceeding 11 by 17 inch, which cannot be reduced, may be inserted in labeled, clear plastic pockets.

(4) **Preface** - Insert a Preface sheet in each volume, following a copy of the cover insert sheet. Include the information shown below in the Preface. No tab sheet is to be used with the Preface sheet.

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: [*Insert name, address, routing code, telephone and FAX numbers of the EFD/EFA technical group administering the OMSI project.*]

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: General Facility and System Descriptions, Utility Connection and Cut-off Plans, Safety Hazards, Warranty Information. It 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: 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 PM, 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 the divisions and sections of the construction specifications. For example, if you want to find information about the fluorescent lights, you would look under Division 16 "Electrical", and then in Section 16510, "Interior Lighting." 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. This must be done for both hard copies and for Recordable Compact Discs.

(5) **Table of Contents** - Provide a Master Table of Contents for the entire set of OMSI manuals. Place the Master Table of Contents after the Preface sheet of 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 division and section of Part III, Product Data.

b. **ELECTRONIC FORMAT** - Provide narrative information in a Word for Windows format, unless otherwise specified by the EFD/EFA Technical Representative. Provide drawings and plans prepared for the OMSI manuals in a CAD format. Name and index the files for ease of identification and update. Provide all files on 3 1/2 inch high density disks.

c. **COMPACT DISC (CD)** - Provide the OMSI manuals on Recordable Compact Disc (CD-R) using Adobe Acrobat 3.0 or similar software capable of producing PDF (Portable Document Format) files. Scanned documents shall be scanned at 150 DPI or better. The PDF files shall be indexed by part (Facility Information, Primary Systems Information, and Product Data) and each entry identified in the table of contents. Indexes and Hyperlinks may be hidden or highlighted. Highlighted indexes may only be UNDERLINED or COLOR TEXT. The final submittal shall include written instructions for installing, accessing and retrieving information from the CD.

4. **DOCUMENTATION SITE VISIT** - Provide the services of one person having detailed technical knowledge of the OMSI manuals to be on site for one day to obtain details and documentation on field changes, to take appropriate photos and to gather missing submittal data. Timing of visit will depend on actual construction progress but will generally occur 60 to 120 days prior to the OMSI manuals 100% submittal date.

5. **VALIDATION SITE VISIT** - Provide the services of two people, who have detailed technical and organizational knowledge of the OMSI manuals, to be on site for one day to perform the validation of the OMSI manuals. The purpose of the validation is to present the OMSI manuals to the users and to verify the OMSI manuals' completeness and accuracy. The validation site visit will be performed after 100% submittal. Contact the EFD/EFA Technical Representative for the exact date.

a. **PRESENTATION** - Provide a presentation of the OMSI 100% submittal manuals to Government and other representatives at the activity site. The presentation details how the OMSI manuals are organized, what they contain, how they are referenced and cross referenced, and how to use them in day-to-day operation, maintenance and repair.

b. **VERIFICATION** - Field verify the accuracy and completeness of the OMSI manuals. This includes verifying that the systems and equipment in the OMSI manuals accurately reflect the as-built conditions; verifying that O&M procedures are appropriate for the systems and equipment that they support; and verifying that equipment nomenclature and system configurations are accurate. Make corrections and recommended in-scope changes to the OMSI manuals prior to delivery of the final submittal.

6. SUBMITTALS

a. CONCEPT SUBMITTAL - Provide one hard copy. The purpose of this submittal is to present, for approval, an overall plan for preparation of the OMSI manuals. Deliver one copy to the EFD/EFA Technical Representative. The submittal includes, as a minimum, the following information:

(1) Identify by name all systems that will be addressed in the OMSI manual.

(2) Provide the format and table of contents of the OMSI manual and include the following:

(a) Sample post type, loose-leaf binder. Show a typical title as it will appear on the front face and also on the spine of the binder.

(b) Proposed divider format with the sample divider and completed tab.

(c) Samples showing the quality of paper and quality of reproduction proposed.

(d) Select one system of moderate complexity and partially develop the various operational and maintenance aspects of the system. This development should have sufficient depth to clearly demonstrate the arrangement and level of detail proposed for all systems that will be included.

(e) A submittal matrix tailored from the construction submittal matrix, to identify those submittals needed for the preparation of the OMSI manuals. The A/E shall use the submittal matrix to track submittals needed for the OMSI manuals.

b. PRELIMINARY SUBMITTAL - Provide two hard copies. Deliver one copy to the designated point of contact at the activity and one copy to the EFD/EFA Technical Representative. Include the cover sheets, spine inserts, table of contents, binders, dividers, and other materials as necessary to demonstrate the proposed physical arrangement of the OMSI manuals and the quality of the copies, dividers and tabs. Present the submittal in sufficient detail to evaluate the data collection and arrangement process. The EFD/EFA Technical Representative copy, with review comments, will be returned to the A/E for preparation of the 100% submittal. The submittal includes, as a minimum, the following information:

(1) All available Part I, Facility Information.

(2) All systems of Part II, Primary Systems Information. At least one system shall be essentially complete. The remaining systems shall be at least 50% complete.

(3) At least two specification divisions of Part III, Product Data.

(4) An updated submittal matrix tailored from the construction submittal matrix, to identify those submittals needed for the preparation of the OMSI manuals. The A/E shall use the submittal matrix to track submittals needed for the OMSI manuals.

c. 100% SUBMITTAL - Provide two hard copies. Deliver one copy to the EFD/EFA Technical Representative and deliver one copy to the designated point of contact at the activity. Include a copy of the preliminary submittal review comments along with the A/E's response to each item. The activity keeps their 100% submittal to operate and maintain the facility from Beneficial Occupancy Date (BOD) through submission of the final submittal. Therefore, the 100% submittal should contain all the required information that is available at the time of submission. The EFD/EFA Technical Representative copy with review comments will be returned to the A/E for preparation of the final submittal. Additional 100% submittal review comments may include problems discovered during the OMSI manuals' review, site validation, and facility start up and will be provided to the A/E at various times before and after facility BOD.

d. FINAL SUBMITTAL - Provide two hard copies and two sets of electronically formatted information. Deliver one hard copy and one set of discs to the EFD/EFA Technical Representative. Deliver one hard copy and one set of discs to the activity point of contact. Include a copy of all the 100% submittal review comments along with a response to each item.

e. **SUBMITTAL SCHEDULE**
(The actual dates will be established during the negotiation)

SUBMITTAL	DUE DATE	TIME FRAME
Concept	_____	60 - 120 days after OMSI award
Preliminary	_____	50-60 % construction completion
100%	_____	60 days prior to BOD
Final	_____	120 - 180 days after BOD