NATIONAL WEATHER SERVICE INSTRUCTION 30-2201
December 25, 2014

Maintenance, Logistics, and Facilities

Technical Orders, NWSPD 30-22

ENGINEERING DOCUMENTATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

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SUMMARY OF REVISIONS: This instruction supersedes *NWSI 30-2201, Engineering Documentation*, dated May 13, 1987. There have been no content changes only administrative and action officer corrections.

Signed 12/11/14
Deirdre Jones, Date
Acting Director, Office of Operational System

Engineering Documentation

Table of Contents Page

1. Purpose and Introduction. This instruction implements NWSPD 30-22, Technical Orders, and defines and describes the Engineering Directives (Directives) system. This is a National Weather Service (NWS) Maintenance, Logistics, and Acquisition Division (OPS1) subsystem, established within the framework of the NWS Directives System (NDS) as defined in NWSPD 1-1, Policy Formulation and NWSI 1-101 NWS, Directives System - Structure and Management. A flow chart depicting interrelationships of directives within the system is contained in Figure 1.

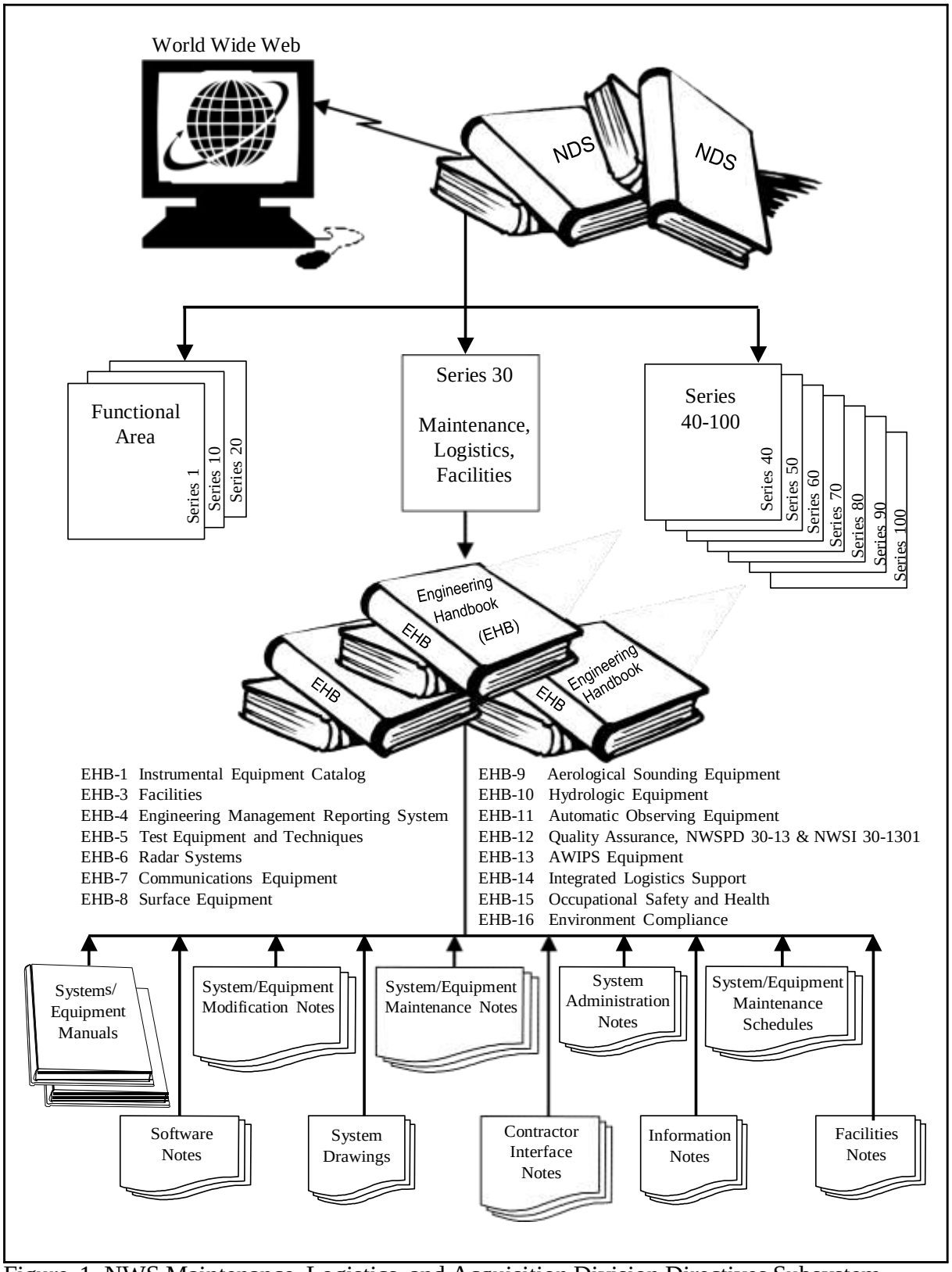

Figure 1 NWS Maintenance, Logistics, and Acquisition Division Directives Subsystem

The engineering directives system serves to:

a. define technical procedures and standards;

b. authorize the installation of modifications;

c. delineate preventive maintenance activities; and

d. complement logistics, training, and quality control activities.

Most permanent technical directives are prepared by the National Weather Service Headquarters (WSH) OPS1 to provide an appropriate level of uniformity and standardization among the regions regarding the sustaining engineering processes for centrally procured and managed systems and equipment. Regional directors may supplement this document to meet regionally specific needs. Requirements may be added to but they may not be weakened.

Modernization of engineering documentation processes is under development by OPS1 and OPS4. Electronic access and distribution is being applied in several pilot projects including technical manuals on CD-ROM and technical directives on the World-Wide-Web home pages. Policies, procedures, and guidance contained in this operations manual will evolve as modern, rapid response, and electronic processes are implemented.

Documents are to follow the formats proscribed herein. Reasonable accommodations (i.e., exceptions) to the rule may occur when systems/equipment are maintained as part of multi-agency agreements. Refer to the specific handbook for guidance.

2. Description of Engineering Handbooks. The Engineering Handbook (EHB) is the primary instrument of the subsystem. File all permanent technical directives in the appropriate engineering handbook. Handbooks refer the reader to specific equipment manuals that may have been prepared by either OPS1 or applicable equipment manufacturer. The subsystem consists of non-equipment manuals (e.g., instrumental equipment catalog, engineering quality assurance directive and instruction), and other engineering handbooks containing one or more of the following parts:

Systems/Equipment Manuals	Software Notes
System/Equipment Modification Notes	System Drawings
System/Equipment Maintenance Notes	Contractor Interface Notes
System Administration Notes	Information Notes
System/Equipment Maintenance Schedules	Facilities Notes

2.1 Contents. There are several engineering handbooks covering particular classes of equipment and certain related functions listed. Each handbook consists of several parts:

Engineering Handbook Number	Title
1	Instrumental Equipment Catalog
2	Intentionally omitted (see NWSM 20-102)
3	Facilities
4	Engineering Management Reporting System
5	Test Equipment and Techniques
6	Radar Systems
7	Communications Equipment
8	Surface Equipment
9	Aerological Sounding Equipment
10	Hydrologic Equipment
11	Automatic Observing Equipment
	Quality Assurance (NWSPD 30-13 & NWSI 30-1301)
13	AWIPS Equipment
14	Integrated Logistics Support (under development)
15	Maintenance Safety Policies and Procedures
16	Environmental Compliance Program (under development)

Electronic access to the handbooks (excluding numbers 3, 5, 14, and 16) is obtained through the web at www.ops1.nws.noaa.gov/ehbs.htm. The contents of the individual handbooks are described briefly below:

a. EHB-1 - Instrumental Equipment Catalog maintained by OPS14, provides a unified means to facilitate the handling of technical stock items; e.g., instrumental supplies and accessories. It also provides a common language by which all concerned may recognize equipment, prepare requisitions, stock and issue equipment and supplies, and maintain consistent related records.

b. EHB-2 - Engineering Training has been absorbed into NDS 20 series documentation, NWSM 20-102.

c. EHB-3 - Facilities maintained by OPS15 provides general guidance and technical criteria for the performance of facilities, site surveys, design, construction, maintenance, and related tasks that fall under the responsibilities of the NWS Field Engineering and Logistics Support Center and regional headquarters facilities engineers (web page under development).

d. EHB-4 - Engineering Management Reporting System (EMRS) (Maintenance Data Documentation Instruction 30-2104) maintained by OPS13 describes the policy and procedures necessary for gathering field engineering data for OPS1. The instruction describes the forms, data description, and the data entry system for EMRS.

e. EHB-5 - Test Equipment and Techniques maintained by OPS1 and under revision, contains test equipment policy, maintenance notes, calibration criteria, maintenance techniques, and a list of current test equipment manuals that are standard for field technicians in performing their work (web page under development).

f. EHB-6 - Radar Systems maintained by OPS4, contains all Radar Operations Center issuances relating to the radar program area. The handbook consists of individual sections dealing with equipment manuals, maintenance notes, modification notes, and maintenance schedules.

g. EHB-7 - Communications Equipment maintained by OPS12, contains all OPS-wide engineering issuances relating to the communications program area. The handbook consists of individual sections dealing with equipment manuals, maintenance notes, modification notes, and maintenance schedules.

h. EHB-8 Surface Equipment maintained by OPS12, contains all OPS1 issuances relating to the surface equipment program area. The handbook consists of individual sections dealing with equipment manuals, maintenance notes, modification notes, and maintenance schedules.

i. EHB-9 - Aerological Sounding Equipment maintained by OPS12, contains all OPS1 issuances relating to the upper air program area. The handbook consists of individual sections dealing with equipment manuals for the various systems, maintenance notes, modification notes, and maintenance schedules.

j. EHB-10 - Hydrologic Equipment maintained by OPS12, contains all OPS1 issuances relating to the hydrologic program area. The handbook consists of individual sections dealing with equipment manuals for the various systems, maintenance notes, modification notes, and maintenance schedules.

k. EHB-11 - Automatic Observing Equipment maintained by OPS12, contains all OPS1 issuances relating to the program areas utilizing completely automated computer-based observing systems. The handbook consists of sections dealing with equipment manuals, maintenance notes, modification notes, and maintenance schedules.

l. EHB-13 - AWIPS Equipment maintained by OPS12, contains all OPS-wide engineering issuances relating to the Advanced Weather Interactive Processing System (AWIPS) program area. For AWIPS, the handbook covers systems administration aspects of the electronics staff work. AWIPS equipment maintenance is contracted.

m. EHB-14 - Integrated Logistics Support (ILS) Procedures maintained by OPS14, describes the policy, procedures, and system acquisition guidance concerning the NWS ILS System (web page under development).

n. EHB-15 - Maintenance Safety Policies and Procedures maintained by OPS15, describes the policies and procedures concerning safe conduct of equipment maintenance.

o. EHB-16 - Environmental Compliance Program under development by OPS15, describes the handling, transport, and documentation of hazardous waste materials (web page under development).

2.2 Tables of Contents. Use tables of contents as indicated below:

a. Handbook. Prepare handbooks in Arial 11 point font. Place a general table of contents at the beginning of the handbook and list all first and second level section titles. Third level section titles are optional. List appendices, tables, and figures under separate headings.

b. Section. Place a table of contents at the beginning of each section and list all titles of material covered in that particular section.

2.3 Format. The standard format for handbooks is described below. Deviations are authorized when necessary to meet special requirements (e.g., EHB-1, Instrumental Equipment Catalog).

a. Table of Contents. The table of contents should follow the example set in Figure 2.

b. Standard Entries First Page. Standard entries on the table of contents/first page are as follows (see Figure 2):

(1) "Issue Date" - Estimated date of delivery to the field plus 2 weeks, or effective date, whichever is later.

(2) "Org. Code" - The routing code of the originator's office.

(3) "Program" - The alphanumeric character identifying the handbook; e.g., EHB-1 (Instrumental Equipment Catalog), EHB-2 (Engineering Training), and EHB-3 (Facilities).

(4) "Part" - The number identifying the major division of the handbook in which the part is to be filed; e.g., Part 1 would be entered as 01.

(5) "Section" - The number identifying the subdivision in the handbook in which it should be filed; e.g., Section 1 should be entered as 01.

Do not number the first page of any part.

Issue Date	Org. Code	NATIONAL WEATHER SERVICE Engineering Handbook	Program	Part	Section
05/24/01	W/OPS12		EHB-9	00	0.0

Directives for Aerological Sounding Equipment
Table of Contents

Figure 2 Sample Engineering Handbook Table of Contents

2.4 Standard Entries on Other Pages. All pages other than the first page of a part have the following standard entries (word processed or blank stock), following the example set in this chapter.

a. Identification of Handbook and Part. Use capital letters for the handbook title followed by the part number in parentheses at the upper outside corner of the page; i.e., this entry appears on the right side of odd pages and on left side of even page.

b. Issuance Date. Place the issuance date on the bottom outside corner of each page; i.e., this entry appears on the right side of odd pages and on left side of even page.

c. Revision Number. Place the revision number in the footer's third line.

d. Page Number. Place the page number in the center of the footer's first line.

e. Numbering and Adding Titles to Paragraphs. Paragraph numbers include the section number or appendix letter. Enter the paragraph number, followed by two spaces, the paragraph title and a period. Number paragraphs as illustrated in Figure 2. Progressive subdivision chapters as follows:

1. SECTION.
1.1 Subsection.
1.1.1 Sub-subsection.

Underline titles for all third level paragraphs and below and capitalize the first letter of significant words.

Do not use numbered paragraphs below the third level subsection. If there is further subdivision of text, place the notation for the fourth level subsection and below aligned with the title of the next higher level. This style places tabs at ¼-inch intervals relative to the left margin. Numbering of paragraphs below the subsection is shown below:

1.1.1 Sub-subsection.

a. Fourth Level Paragraph.

(1) Fifth Level.

(a) Sixth Level.

The use of small letters to enumerate items for emphasis or clarity is optional within numbered sections of subsections where no further breakdown is required.

2.5 System/Equipment Manuals. Equipment manuals are often included within engineering handbooks. These sections contain a brief narrative describing the processes in which equipment manuals are issued, revised, and distributed.

2.5.1 Contents. Precede each major section of an equipment manual with an index of specific equipment. There are separate sections for each NWS system listing all applicable manuals.

2.5.2 Coding. All equipment sub-manuals are identified by a number related to the basic handbook number. For example, equipment manual 9-301 is associated with EHB-9.

2.6 System/Equipment Maintenance Notes. This section consists of a short narrative describing the function of the maintenance notes and methods of issue, revision, and distribution,

together with an index of all notes for particular systems encompassed under a particular handbook. Following the index, insert each sequential note by equipment in the handbook. Consecutively number all maintenance notes.

2.6.1 Format. The standard format for maintenance notes is described below. Like engineering handbooks, write maintenance notes in Arial 11 point font. Deviations are authorized when necessary to meet special requirements.

a. Standard Entries First Page. Standard entries on the table of contents/first page are as follows (see Figure 3):

(1) Engineering Handbook, Volume, and Section. The handbook under which the maintenance note is included. The maintenance area, and the sequential number assigned to the maintenance note.

(2) Identifying Organizational Information. The Division, routing code and initials of the person who developed the maintenance note.

(3) Title of the maintenance note.

(4) General description of the maintenance note.

(5) Procedure.

b. Standard Entries on Other Pages. Place footers (alternating) at the bottom outside corner of each page:

(1) Identification of Handbook and Issuance Date. Place the handbook abbreviation (e.g., EHB-11) in a footer at the bottom outside corner of each page along with the issuance number (i.e., this entry appears on the right side of odd pages and on left side of even page).

(2) Page Number. Place the page number in the center of the footer's first line.

ENGINEERING HANDBOOK 11 VOLUME 2 SECTION 2.6
ASOS MAINTENANCE NOTE 20 (for Electronics Technicians)
Maintenance, Logistics, and Acquisitions Division
W/OPS12: AJW

Freezing Rain Sensor Field Calibration

GENERAL

This note provides information concerning the calibration of new Freezing Rain sensors. No field calibration will be done by ...

PROCEDURE

SECTION V. MAINTENANCE

11.5.1 INTRODUCTION

This sensor provides the preventive and corrective maintenance procedures for the Freezing Rain Sensor. ...

11.5.2 PREVENTIVE MAINTENANCE

The freezing rain sensor ...

11.5.3 CORRECTIVE MAINTENANCE

Corrective maintenance of the ...

a. Using the Laptop Computer With the Freezing Rain Sensor. In order to communicate with the sensor, ...

EHB-11
Issuance 02-

Figure 3 Sample First Page of Maintenance Note

c. Standard Entries on Last Page. Include in bold the following as the last paragraphs of the maintenance note:

(1) Change or page removal instructions;

(2) EFFECT ON OTHER INSTRUCTIONS. If there are no instructions, enter "None."

(3) REPORT MAINTENANCE ACTION. Include reporting instructions, if any.

(4) Add 5 lines, and the words, "Director, Maintenance, Logistics, and Acquisition Division".

d. Numbering, Indenting, and Adding Titles to Paragraphs. Paragraph numbers include the section number or appendix letter. Enter the paragraph number, followed by two spaces, and the paragraph title.

(1) Section Paragraphs. Center, capitalize, and bold section paragraphs. Include the section number.

(2) Second Level Paragraphs. Bold font second order paragraphs (e.g., 11.5) with the paragraph number and title capitalized. The paragraph begins at the left margin.

(3) Third Level Paragraphs. Use normal font for third level paragraphs (e.g., 11.5.3) with the first letter of the title capitalized and the title underlined. Begin the paragraph at the left margin.

2.7 System/Equipment Modification Notes. This section contains a brief statement of the purpose of modification notes, how derived, and methods of issuance and distribution. Following the general statement, place an index listing, in numerical sequence, all modifications by applicable systems. File modification instructions in the handbook in the appropriate section in ascending order by equipment type and modification number.

Like engineering handbooks, write maintenance notes in Arial 11 point font. Deviations are authorized when necessary to meet special requirements.

2.7.1 Standard Entries First Page. Standard entries on the title of contents/first page are as follows (see Figure 4):

a. Engineering Handbook, Volume, and Section. The handbook under which the maintenance note is included. The maintenance area, and the sequential number assigned to the maintenance note.

b. Identifying Organizational Information. The division, routing code and initials of the person who developed the maintenance note.

c. SUBJECT of the modification note.

d. PURPOSE of the modification note.

e. EQUIPMENT AFFECTED.

ENGINEERING HANDBOOK 11 VOLUME 2 SECTION 3.6
ASOS MODIFICATION NOTE 29 (for Electronics Technicians)
Maintenance, Logistics, and Acquisitions Division
W/OPS12: BGM

SUBJECT	:	Installation of 3K ohm resistor on wind sensor
PURPOSE	:	Eliminate the wind sensor data quality error caused by under current condition
EQUIPMENT AFFECTED	:	ASOS wind sensor
PARTS REQUIRED	:	1 (ea) Resistor 3K ohm 10 watt or 2 (ea) 6K ohm 5 watt resistors
SPECIAL TOOLS REQUIRED	:	None
MOD PROCUREMENT	:	None
EFFECTIVITY	:	
ESTIMATED TIME REQUIRED	:	1 Hour
EFFECT ON OTHER INSTRUCTIONS	:	None
AUTHORIZATION	:	This modification is authorized by ECP APO03 (S00683). Approved with Changes by SRG on 6/15/95
VERIFICATION STATEMENT	:	Modification was tested at two sites; SAT and ELP

GENERAL:

The purpose of this modification note is to provide ....

EHB-11
Issuance 95-10
7/18/95

Figure 4 Sample First Page of Modification Note

f. SPECIAL TOOLS REQUIRED.

g. MODIFICATION PROCUREMENT.

h. EFFECTIVITY.

i. ESTIMATED TIME REQUIRED.

j. EFFECT ON OTHER INSTRUCTIONS.

k. AUTHORIZATION.

l. VERIFICATION STATEMENT.

2.7.2 Standard Entries on Other Pages. Place footers (alternating) at the bottom outside corner of each page:

a. Identification of Handbook and Issuance Date. Place the handbook abbreviation (e.g., EHB-11) in a footer at the bottom outside corner of each page along with the issuance number (i.e., this entry appears on the right side of odd pages and on left side of even page).

b. Page Number. Place the page number in the center of the footer's first line. Do not include the page number on the first page.

2.7.3 Standard Entries on Last Page. Include the following in bold as the last paragraphs of the maintenance note:

a. REPORTING INSTRUCTIONS. Include a target date from receipt of the modification and any unique reporting requirements.

b. Add 5 lines, and the words, "Director, Maintenance, Logistics, and Acquisition Division".

2.8 System/Equipment Maintenance Schedules. This section consists of a short statement describing the function of maintenance schedules, priority criteria, and methods of issue, revision, and distribution together with an index of all schedules for equipment associated with a particular handbook. File each schedule after the index.

2.9 Facilities Notes. Facilities notes consist of a short statement describing the purpose of the facilities note, methods of issue, revision, and distribution. Consecutively number all facilities notes.

2.10 AWIPS Documentation. The following documents are used by the AWIPS program. Instructions on their use are provided in EHB-13.

a. System Administration Notes

b. Software Notes

c. System Drawings

d. Contractor Interface Notes

e. Information Notes

3. Engineering Handbook Issuances. WSH issuances contain all necessary information in a readily understandable form. Include with each issuance a paragraph titled "Effect on Other Instructions" and with contents providing instructions regarding other existing directives. In modification notes, include a paragraph titled "Reporting Modifications" providing information on reporting requirements. A target date for completion may also be included.

4. Issuing Authority. The issuing authority section defines the authority to issue directives.

4.1 Weather Service Headquarters. WSH engineering technical material intended for filing in engineering handbooks is signed by the Director, OPS1. The materials are the sole authorizing documents permitting modifications to equipment or for establishing or altering engineering and maintenance standards. Transition to electronic access and distribution of engineering documentation may eventually substitute other forms of approval for the signature authorization.

4.2 Regional Headquarters. The regional director is authorized to issue technical information consisting of material supplementary to WSH engineering manuals, handbooks, schedules, etc., where necessary to cover particular needs of the region. This authority may be re-delegated through the use of a supplement. Forward five copies of all supplements dealing with engineering matters to OPS1 and one copy to WSH Management and Organization Director (Attn: W/CFO3). The original is maintained by the issuing authority.

5. System Management. This section defines overall responsibility for management of Directives and provides instructions on the distribution and inventory of directive material.

5.1 Responsibility. Responsibility for the Directives system is delegated through OPS to the Director, OPS1. Comments and inquiries relating to the overall subsystem should be addressed to that division through the regional headquarters.

5.2 Distribution. In general, distribution of engineering handbooks is made on a selective basis. Copies of each are provided to all electronics technicians (ET), and specific field stations receiving only those copies applicable to equipment located at the facility. An exception to this is EHB-1, which is issued to all stations and personnel requiring its use.

Copies of directives and handbooks for personnel other than those indicated above can be obtained by request through the regional office to OPS1.

5.3 Handbook Maintenance. Each recipient of engineering handbooks is responsible for filing technical material and ensuring the handbooks are current. OPS1 ensures handbook indexes are annually updated during the month of January to reflect changes to technical material. OPS1 ensures these indices are posted on the web. Site technical staff should download, as required, updated materials to maintain their handbooks.

Electronic Systems Analysts (ESA) periodically check site EHBs for completeness. ESAs are responsible for arranging for disposition of the handbooks and related issuances for any ET leaving the area following national and regional policy.

Regional facilities engineers periodically check sector facilities technicians' (SFT) handbooks for completeness. They arrange for disposition of the handbooks and related issuances for any SFT leaving the area following regional policy.

5.4 Requests for Additional Engineering Handbook Issuances. The need sometimes arises for individual manuals or other handbook issuances to replace lost or worn-out items of an individual's copy of an engineering handbook. These should be ordered by citing the complete description as it appears on the pertinent handbook index page or the catalog description of the program as described in EHB-1. All EHB issuances are cataloged with a national stock number (NSN) and agency stock number (ASN) according to equipment type by the Logistics Branch (OPS14). All hard copies of handbook material are available from the National Logistics Support Center. Requesting activities should request desired material by NSN or ASN or download directly from the web (see section 2.1). Hard copy items will be deleted upon exhaustion of current stock.

A study is underway to provide a replenishment of handbook issuances directly on the World-Wide-Web and CD-ROM.