TMCR NO. NDMS-100010-0
Date: 2 November 20

TECHNICAL MANUAL CONTRACT REQUIREMENT (TMCR)

SUBJECT: Commercial Off-The-Shelf (COTS) Equipment Manual Supporting FFG/DDG MSMO.

ACQUISITION ACTIVITY: NAVSEASYSCOM
1333 Isaac Hull Avenue
S. E. Stop 2316
Bldg 197, Room 3E1725
Washington, DC 20376

CONTRACTOR:

CONTRACT NO.:

DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

This document prescribes the Technical Manual format, style, technical content, preparation, and delivery requirements. Instructions and guidance are provided to assist Technical Manual preparers in the development of accurate, adequate, comprehensible, and usable technical documentation that conforms to and complies with established NAVSEA policy.

This document is effective upon receipt and supersedes all previous information and instructions, regardless of source, related to the preparation of a NAVSEA Technical Manual for the subject equipment. Conformance with the requirements specified are mandatory. No changes or waivers are authorized without the express written NAVSEA approval.

PREPARED BY

COMMANDER
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BY DIRECTION OF

NAVAL SEA SYSTEMS COMMAND (SEA 04L)

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520	Acceptability Certification (COTS Manual)
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TECHNICAL MANUAL CONTRACT REQUIREMENT (TMCR)

DATE: 2 November 2009 **TMCR NUMBER: NDMS 100010-000**

REQUESTED BY: NAVSEASYSCOM
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PREPARED BY: Victor A Perez
CODE: SEA21 FL23

CONTRACTOR:

CONTRACT NO.:

SUBJECT: Commercial Off-The-Shelf (COTS) Equipment Manual Supporting FFG/DDG MSMO.

SCOPE: This TMCR presents requirements for Accept/Reject Criteria for Off-The-Shelf commercial equipment manuals and the preparation of supplemental data for commercial equipment technical manuals. The requirements for the preparation of the technical content of the subject technical manual were taken from the applicable specifications and standards for technical content of manuals as specified in NAVSEAINST 4160.3A.

The requirements listed in the Contract Data Requirments List (DD Form 1423), in conjunction with the requirements of the specific contract line items as specified herein, constitute the data to be delivered, the products to be prepared, and the resulting tasks to be performed by the contractor.

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1.0 DELIVERABLES.
The following deliverable items shall be prepared as specified in Section 3 of this document.

DATA ITEMS.

1.1 TECHNICAL MANUAL SCHEDULE, STATUS AND COSTS REPORTS.

1.2 QUALITY ASSURANCE PROVISIONS.

1.2.1 Validation Plan.

1.2.2 Validation Certification.

1.3 COMMERCIAL OFF-THE-SHELF (COTS) MANUALS.

1.4 SUPPLEMENTAL DATA.

1.5 FINAL REPRODUCIBLE COPY (FRC).

2.0 APPLICABLE DOCUMENTS.

2.1 Specifications.

The following documents were used to establish the requirements of this document.

MIL-DTL-24784B(SH)	Manuals, Technical: General Acquisition and Development Requirements
MIL-DTL-24784/4B(SH)	Associated Detail Specification Commercial Off-The-Shelf (COTS) Equipment Manual Requirements

2.2 Standards.

MIL-STD-1388-1	Logistics Support Analysis
MIL-STD-1388-2	DOD Requirements for a Logistics Support Analysis Record

(Copies of standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.3 Handbooks and Manuals.

Government Printing Office.

United States Government Printing Office	Style Manual

2.4 Defense Logistics Services Center (DLSC).

H4/H8	Commercial and Government Entity (CAGE) Codes

Application for copies should be addressed to:

Defense Logistics Services Center,
(ATTN: DLSC-SBB), Federal Center,
Battle Creek, MI 49107-3084

2.5 Department of Navy.

SL160-AA-LST-010/TM-WORDS or EL160-AA-LST-010/TM-WORDS	Baseline Word Lists for NAVSEA/ SPAWAR Technical Manuals

Application for copies should be addressed to:

The Standardization Documents Order Desk,
Building 4D,
700 Robbins Avenue,
Philadelphia, PA 19111-5094

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2.6 Forms.

Form NAVSEA 4160/1	NAVSEA (User) Technical Manual Deficiency/Evaluation Report (TMDER)
Form NAVSEA 4160/3	Technical Manual Validation Certificate

Copies of forms required by the preparing activity in connection with specific procurement functions should be obtained from:

The Standardization Documents Order Desk,
Building 4D,
700 Robbins Avenue,
Philadelphia, PA 19111-5094

2.7 Other Government Documents.
The following other Government documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Public Law 91-596

Executive Order 12196	Occupational Safety and Health Programs for Federal Employees
Code of Federal Regulations (CFR)	Title 29 CFR - Labor

REGULATIONS

DFAR - Subpart 27.4	Defense Federal Acquisition Regulation: Technical Data, Other Data, Computer Software, and Copyrights
DFAR - Part 52	Defense Federal Acquisition Regulation: Solicitation Provisions and Contract Clauses

2.8 NON-GOVERNMENT PUBLICATIONS.
The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation.

Aerospace Industries Association, AIA-TR91-1 Publications DOD Liaison	Recommendation for Hazardous Materials Warnings in Technical Data

(Application for copies should be addressed to the Aerospace Industries Association, 1250 Eye Street NW, Washington, DC 20005.)

2.8.1 American National Standards Institute, Inc. (ANSI).
The following standards shall apply:

ANSI Z535.3	Criteria for Safety Symbols

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Application for copies should be addressed to:

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American National Standards Institute, Inc.
25 West 43rd Street
New York, N.Y. 10036

or  http://www.ansi.org
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2.8.2 American Society for Testing and Materials (ASTM).
The following standards shall apply:

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   ASTM D3951                    Standard Practice for Commercial
                                 Packaging
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Application for copies should be addressed to:

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American Society for Testing and Materials,
100 Barr Harbor Dr.,
West Conshohocken, PA 19428-2959

or http://www.astm.org
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3.0 REQUIREMENTS.
In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

Technical manuals shall not contain copyrighted material except as specified in the Federal Acquisition Regulations/Defense Federal Acquisition Regulation Supplement. When copyrighted material is to be included in a technical publication, the preparer shall obtain prior written permission from the copyright owner/authorized agent for its use. The signed, written permission shall be delivered with the final reproducible copy when it is delivered. The written permission shall contain a statement declaring whether or not a copyright credit line is required. Sound engineering principles and techniques, available engineering analyses, service experience, performance data on the item and on similar items, and all other reliability and maintainability data available shall be used in the preparation of specific instructions.

3.1 TECHNICAL MANUAL SCHEDULE, STATUS AND COSTS REPORTS.

3.1.1 Schedule and Status Reports.
A technical manual schedule and status report shall be supplied at the frequency determined by the contract or SEATASK. The report shall be in a narrative format and indicate the information necessary to provide a comprehensive management level analysis of all development activities.

3.1.2 Cost Reports.
Technical manuals shall be acquired in a cost-effective manner. Cost and pricing data shall be obtained for each new, revised or changed manual. A separate analysis shall be provided together with supporting documentation for each manual developed. The cost of technical manuals shall be limited to the effort and material needed to produce the manual from source data.

3.2 TECHNICAL MANUAL QUALITY ASSURANCE DATA.

3.2.1 Validation Plan.
A validation plan shall be developed and shall be acceptable to the government. It shall reflect compatibility with the overall maintenance and support plan, outline the preparing activity`s recommended validation procedure, and indicate the scope of the validation effort. It shall also include manuals for which requirements have yet to be defined, such as equipment component and support equipment manuals. The plan shall reflect the requirements of this document. The plan shall include

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recommendations for simultaneous validation or verification as appropriate. The validation plan shall ensure there is a system for inspection, validation, and correction of the manual. Validation shall provide a measure of the overall quality of the manual. When the Government performs an inspection at a preparing activity`s plant, such inspection shall not be used by the preparing activity as evidence of effective control of quality. When revisions or corrections are required after any inspection, validation, or review, there shall be reinspection, revalidation, or re-review by the preparing activity, and if necessary, by the Government of all data affected. The validation plan shall include:

a. Validation by which the technical manual is tested for technical adequacy and accuracy and compliance with the provisions of this document and other technical contractual requirements.
b. Detailed review of FRC to ensure that this material is identical to the authorized, validated, verified, corrected, and accepted draft or preliminary manuals and complies with legibility and reproducibility requirements.

3.2.2 Validation Certification.
The preparing activity shall prepare a validation certification attesting to the technical manual adequacy and accuracy by actual performance or simulation. Individual validation certification reports shall be prepared for each technical manual validation by the preparing activity, using NAVSEA Form 4160/3 from S0005-AA-PRO-010/TMMP as the certification document.

3.3 COMMERCIAL OFF-THE-SHELF (COTS) MANUALS.
A copy of the existing COTS manual shall be required for review by the Government, (see Manual Evaluation Checklist Figure 521 and Acceptability Certification Figure 520), to determine whether or not the manual proves acceptable or non-acceptable. An acceptable commercial manual shall contain the data listed in the following subparagraphs in a sequence of arrangement that provides continuity. If a manual covers different models, series, configurations of the equipment, the differences shall be clarified by the use of different data sheets, errata sheets, change sheets, or be included in the text or table(s) in the manual. The manual shall precisely reflect the hardware configuration of the equipment/system. The manual shall reflect the maintenance philosophy of the hardware as established by the manufacturer, and the maintenance philosophy shall be such that it can be applied by the intended Government user. The amount of data required shall be determined by the complexity/simplicity of the equipment. Usage philosophy includes installation plans, maintenance concept, operational environment, and spare support approach. The manual shall consist of all data (volumes, folders, inserts, specification sheets, and other documents) required for operation and maintenance of the equipment/system as determined by the contracting activity.

3.3.1 Style and Format.
The existing COTS manual shall meet the following requirements:

3.3.1.1 Comprehensibility and Readability.
The text and text-graphics combination of the manual shall be at the level of understanding of the intended user. The reading grade level shall be that of the intended user.

3.3.1.2 Arrangement.
The overall arrangement of content, even though vendor unique, shall be organized in a manner sufficient to provide continuity of descriptions, processes, and procedures.

3.3.1.3 Legibility.
The entire publication shall be clear and easily read. Text shall be no smaller than 8-point (1 point = 1/72 inch). Parts lists shall be no smaller than 6-point. Lettering on diagrams shall be no smaller than 6-point.

3.3.1.4 Size.
Manuals size shall be no smaller than 4 by 5 1/2 inches and no larger than 17 by 11 inches.

3.3.1.4.1 Safety.
The manual shall include safety information that is consistent with the safety standards established by 29 CFR , Part 1910 and Executive Order 12196.

3.3.1.4.2 Dangers, Warnings, Cautions, Notes.
The manual shall contain dangers, warnings, cautions, and notes similar to those specified in paragraph 3.4.1.8.3.

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3.3.1.4.3 Federal Protection Standards.
Information concerning the use, transportation, handling, storage or disposal of fuel, toxic or hazardous substances, chemicals, ordnance, and munitions shall be clearly stated and shall be consistent with Federal Protection Standards.

3.3.1.5 Illustrations.
The manual shall contain illustrations to support the text. The illustrations shall be integrated with the text or their location shall be referenced in the text.

3.3.1.6 Maintenance.
The manual shall reflect the maintenance philosophy of the hardware as established by the manufacturer, and the maintenance philosophy shall be such that it can be applied by the intended Government user.

3.3.2 Content Requirements.
Except as determined otherwise by the Government, acceptable COTS manuals shall contain but not be limited to the following:

a. Front matter: Cover or title page, table of contents, and safety precautions.
b. Introduction.
c. Preparation for use.
d. Installation Instructions.
e. Principles of Operation (at the level required to support maintenance)
f. Operating Instructions
g. Maintenance and servicing instructions (preventive and corrective).
h. Reprogramming.
i. Preparation for shipment.
j. Storage.
k. Parts list.
l. Illustrations and diagrams.
m. Overhaul instructions (as applicable).

3.3.2.1 Front Matter.

3.3.2.1.1 Cover Title Page.
The manual shall have a cover, title page, or first page showing the date the manual was issued, revision designator (if applicable), the manufacturer's identification name and address, the equipment name, the manufacturer's model designation, and serial or identification numbers for the equipment covered. See Federal Acquisition Regulations concerning contract numbers and markings on publications.

3.3.2.1.2 Table of Contents.
A manual containing more than 25 pages shall include a table of contents. It shall list all parts, chapters, sections, and paragraphs in the order of presentation and with the same title used in the text. It shall include a list of illustrations and a list of tables if the manual contains more than 10 illustrations or tables.

3.3.2.1.3 Safety Precautions.
The manual shall contain safety precautions where hazards, such as high voltage, may be present during installation, operation, or maintenance of the equipment. Health hazards, such as electrostatic discharge, radio frequency radiation, radioactive materials, the presence of poisonous fumes or explosive gases, and the depletion of oxygen from the air in a closed environment, shall be preceded by a danger, warning or caution at the point in the procedure where the hazard is likely to be encountered.

3.3.2.2 Introduction.
The manual shall contain an introduction, or introductory material, containing the following:

a. Purpose and functions.
b. Capabilities.
c. Performance characteristics.
d. Description (equipment model, dimensions, weight, volume, and center-of- gravity, when applicable).

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e. Power and utility information.
f. Environmental information.
g. List of items furnished.
h. List of additional items required for operation and maintenance, but not supplied with equipment.
i. Tools and test equipment.
j. Warranty information.
k. Shipping and handling precautions.
l. Storage data.

3.3.2.3 Preparation for Use.
The manual shall contain unpacking and assembling instructions. Inspection for in-shipment damage and instructions on how to handle damaged equipment shall be included.

3.3.2.4 Installation Instructions.
Special installation instructions shall include requirements for foundations, ventilation, clearances, plumbing and electrical connections, mountings, wiring runs, initial lubrication, and alignment as applicable.

3.3.2.5 Principles of Operation.
The manual shall contain principles of operation information at the technical level necessary for the intended user.

3.3.2.6 Operating Instructions.
Operating instructions shall include:

a. Illustrations and explanations of the uses and functions of all controls and indicators (including settings and readings, if applicable).
b. Initial adjustments and control settings.
c. Start up procedures.
d. Normal operation.
e. Operation under emergency, adverse, or abnormal conditions (if different from normal operating procedures).
f. Shut down procedures.
g. Emergency shutdowns (if required).
h. Interface instructions.

3.3.2.7 Maintenance and Servicing Instructions (Preventive and Corrective).
Instructions shall include a list of test equipment, special tools, and materials needed for maintenance and service. This list shall include nomenclature, part and model number, application, range, and accuracy. Instructions or illustrations shall explain or show how test connections are made. Actions and normal indications shall be defined for each test.

3.3.2.7.1 Cleaning and Lubrication.
Periodic cleaning and lubrication information, covering types of cleaning agents or lubricants (commercial or military) shall be included. Frequency of lubrications and intervals (monthly, quarterly, and semiannually, hours of operation, mileage, and so forth) shall be presented. Lubrication points and required amounts shall be identified. When applicable pictorial format for lubrication instructions shall be included to clearly illustrate location of each lubrication point. Cleaning and lubrication during repair, replacement, or reassembly shall be included in the instructions covering those actions. (see 3.3.2.7.5.)

3.3.2.7.2 Performance Verification.
Instructions for calibration of the Test, Measurement, and Diagnostic Equipment needed to restore the equipment to serviceable accuracy (performance verification) shall be provided. These instructions shall be complete step-by-step procedures which will enable the user to check the accuracy of the indications or readings. The location of test connections and the values expected at these points shall be included. Adjustment of built-in self test features shall be included when applicable. Data shall include the recommended frequency of adjustments and verification checks required. When appropriate, the data shall allow for the accomplishment of these adjustments by utilizing a wiring harness, test points, and so forth, that are accessible from outside the equipment case. Data shall include a list of the additional equipment, such as temperature, vacuum, pressure, hydraulic or pneumatic gauges, decade boxes, voltmeters, signal generators, required to accomplish the verification. The listing shall show methods of use or application, range of scales, and specific minimum tolerances or percentages of accuracy.

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3.3.2.7.3 Inspection.
Instructions, including scheduling, for inspection of equipment for damage and wear shall be provided with emphasis on allowable service limits such as wear, backlash, end play, balance, and length and depth of scoring. Allowable service limits are acceptable wear tolerances which will not impair performance. They are not to be confused with manufacturing tolerances.

3.3.2.7.4 Troubleshooting.
Malfunctions that might occur during operation of the equipment shall be identified. Troubleshooting data, and fault isolation techniques shall include:

a. The indication or symptom of trouble.
b. The instructions necessary, including test hookups, to determine the cause.
c. Action or reference to action to restore the equipment to operating conditions.
Applicable information shall be in chart form, logic tree form, in tabular format with appropriate headings, or as logic, block, or schematic diagrams. The established maintenance concept for the associated equipment shall dictate the depth of the troubleshooting such as, localizing a defective circuit card assembly and ending the action by removing and replacing the circuit card assembly as contrasted with the carrying out the troubleshooting process on the defective circuit card assembly to determine the specific piece part that is defective.

3.3.2.7.5 Disassembly, Repair, Replacement, and Reassembly.
Sequential instructions for disassembling, repairing, replacing, and reassembling the equipment shall be provided. Test, adjustment, and check-out data after reassembly shall be provided. Illustrations, including exploded views, shall be used as necessary to support each of these functions.

3.3.2.8 Reprogramming.
A description of reprogrammable memory, reprogramming theory, program setup, program confidence check-out, program loading, and programming procedures shall be provided for equipment having a reprogrammable memory.

3.3.2.9 Preparation for Shipment.
Manuals shall contain instructions for the following, as applicable:

a. Disassembly, removal, and separate packaging of electrostatic sensitive discharge devices or fragile components.
b. Use of reusable shipping cases or containers.
c. Special cradles.
d. Mounting.
e. Securing.
f. Covering and preservation.
g. Precautions for shipment.
h. Shipment and unloading.

3.3.2.10 Storage.
Manuals shall contain instructions for the following:

a. Indoor and outdoor storage.
b. Temperature and other environmental limitations.
c. Storage facilities.
d. Dunnage.
e. Ventilation.
f. Revetting.
g. Drainage.
h. Staking.
i. Grounding.
j. Covering.
k. Preservation.

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3.3.2.11 Parts List.
The manual shall include a parts list containing positive identification of parts for support of the equipment and shall include actual manufacturer or vendor part numbers or generic description necessary to obtain replacement parts.

3.3.2.11.1 Parts List Illustrations.
Clear and legible illustrations shall identify component parts and parts relationships.

3.3.2.11.2 Parts Listings.
Part numbers and part names shall be shown on illustrations or separately listed. When the illustrations do not contain part numbers and part names, both the illustrations and separate listings shall show either index, reference, or key numbers which will cross-reference illustrated parts to listed parts. The parts list shall cite the actual manufacturer or vendor and their part number or generic description. Parts in the listings shall be grouped by assemblies, subassemblies, and modules with the parts identified to the assembly from which they are components.

3.3.2.11.3 Common Commercial Parts.
Common commercial hardware and items that are not of special design, such as bolts, washers, nuts, screws, fittings, keys, hinges, wire, cable, gasket material, tubing, hose, and so forth, and are obtainable from a wide range of sources, shall be identified by part number or the notation "Commercial" instead of a part number. The part name (nomenclature or description) shall be complete enough to facilitate substitution of equivalent items from existing Government stock as in the example below.

Table I. Examples of part number descriptions.

Figure and Index No.	Part No.	Part Name (Nomenclature or Description)
2-4	Commercial	NUT, Hex head,plain steel, 1/4-20 UNC-3B
2-5	Commercial	WIRE, Electrical, copper, tin plated, No. 14 AWG, 19 strands of No. 27 AWG, 0.250 in. dia

3.3.2.12 Illustrations and Diagrams.

3.3.2.12.1 Illustrations.
Manuals shall contain illustrations (line drawings, photographs or halftones) for locating and identifying all components significant to operation and maintenance and to show configuration and parts relationship for removal and disassembly procedures. Photographs (prescreened) shall be detailed and sharp, free of heavy shadows, distorted objects, cluttered foregrounds or backgrounds, and give good contrast from white, middle tones, and black. Free hand sketches shall not be acceptable.

3.3.2.12.2 Diagrams.
As applicable, the following diagrams shall be included in the manual:

a. Simplified functional block.
b. Locator.
c. Piping.
d. Plumbing.
e. Hydraulic.
f. Schematic.
g. Electrical.
h. Digital.
i. Other, as necessary.

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3.3.2.12.3 Symbols.
Symbols used on illustrations and diagrams shall be standard or common to the trade or commodity. Where nonstandard symbols are used, explanations shall be provided.

3.3.2.13 Overhaul Instructions.
When applicable, the manual shall include overhaul instructions to return the equipment to mission capable condition. As a minimum, the instructions shall include the following:

a. List of support equipment, special tools, and facilities required.
b. List of mandatory parts.
c. Preshop analysis, as applicable.
d. Step-by-step procedures for performing all functions including disassembly, removing, replacing, diagnosing, installing, repairing, assembly, in-process testing, adjusting, and inspecting.
e. Final tests to ensure satisfactory performance of the equipment or system overhauled.

3.4 SUPPLEMENTAL DATA.

3.4.1 Supplemental Data.
After the Government determines that the COTS manual meets the acceptability criteria of 3.3 and 3.3.2, and that supplemental data is required, supplemental data shall be developed in accordance with this document in contractor format and in accordance with the requirements on the Content/Format Selection Summary Sheet. (See figure 519), or other applicable contractual document. This data shall supplement the basic COTS manual and shall not substantially duplicate any data contained in the existing COTS manual.

3.4.1.1 Identifying Technical Publication Sheet (ITPS).
Unless otherwise specified, an Identification Sheet for Commercial Manuals (examples are shown on figure 515 and figure 516 shall be tailored to reflect only that information applicable to the acquisition. The appropriate distribution statement, disclosure notice, and authority notice shall appear as specified by the Government. Other pertinent data shall be inserted by the contractor as provided by the Government.

3.4.1.2 Style, Format, and Form.

3.4.1.2.1 Style and Format.
Unless otherwise specified , supplemental data shall be in contractor style and format.

3.4.1.2.2 Form.
Supplemental data shall be a separately numbered and bound manual (except as specified in 3.4.1.2.3) and shall be in one or more of the following forms as specified in this document by the Government:

a. Review Draft Copy.
b. Preliminary Technical Manual.
c. Final Reproducible Copy.
d. Digitized media.
e. Direct Image.

3.4.1.2.3 Insert Pages.
If supplemental pages are less than 50 percent of the existing manual and can be inserted into the existing COTS manual (that is, the manual is not permanently bound), supplemental data may be developed as change pages (insert pages, appendix pages, and so forth) and issued as a change package.

3.4.1.3 Copyrights and Proprietary Information Credit Line.
Technical manuals shall not contain copyrighted material except as specified in the Federal Acquisition Regulations and Defense Federal Acquisition Regulation Supplement. When copyrighted material is to be included in a technical publication, the developer shall obtain prior written permission from the copyright owner or authorized agent for its use. The signed, written permission shall be delivered together with the final reproducible copy. The written permission shall contain a

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statement declaring whether or not a copyright credit line is required. When it is necessary to include copyright and proprietary material, it shall be clearly identified and the following warning statement shall be included on the title page:

"This document contains copyright or proprietary materials. Infringement of copyright or proprietary material may violate existing Federal laws and statutes and result in criminal penalties, imprisonment, or removal from office."

3.4.1.4 Content.
Content of the supplemental data shall be as specified in this document and on the applicable Content/Format Selection Summary Sheet (figure 519)or other contractual document provided by the Government. Unless otherwise Specified in this document, the data shall be presented in accordance with the Requirements specified and in the following order:

a. Cover and title page (see 3.4.1.8.1).
b. List of effective pages (see 3.4.1.8.2).
c. Safety precautions.
d. Table of contents.
e. Reporting of errors statement.
f. Maintenance forms and records.
g. Administrative storage.
h. Destruction of military material to prevent enemy use.
i. Lubrication instructions (see 3.4.1.8.5).
j. Preventive maintenance checks & services.
k. Spare and repair parts - (see 3.4.1.8.6).
l. Recommended changes, user activity comment sheet, or technical manual deficiency report applicable to the particular service, as provided by the Government.
m. Other requirements as specified (when using manuals evaluation checklist as a guide, other required data may be indicated thereon).

3.4.1.5 Warranty Information.
If applicable, the COTS manual supplemental data shall contain warranty information pertinent to the equipment covered. It shall include data such as duration of warranty and serial numbers of equipment covered. If warranty is covered separately or in another available document, reference shall be made to that document.

3.4.1.6 Advertising.
Except for the identity of the manufacturer or contractor, supplemental data shall not contain advertising.

3.4.1.7 Equipment and Model Coverage.
Only equipment and models, accessories, and components specified shall be covered in the supplemental data.

3.4.1.8 End Item Identification.
Unless otherwise specified, the federal item name, national stock number(NSN), part number, model number, and applicable contract number shall be overprinted on the cover or the first page of the manual.

3.4.1.8.1 Publication Number and Date.
The publication number, assigned by the Government, and date shall be overprinted on the cover and first page of the supplement in accordance with figure 4.

3.4.1.8.2 List of Effective Pages.
A list of effective pages that will include the basic COTS manual and the supplemental data, shall be prepared in accordance with this document.

3.4.1.8.2.1 List of Effective Pages for Multivolume Manuals.
A list of effective pages covering all volumes shall be prepared for the basic manual and shall be included in Volume 1. In a multivolume manual, each of the volumes, except Volume 1, shall include the listing of pages provided in that particular volume.

3.4.1.8.3 Danger, Warnings, Cautions and Notes.
Dangers, warnings and cautions shall precede the text but follow paragraph headings to which they apply. Notes may

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precede or follow applicable text, depending upon the material to be highlighted. Dangers, warnings, cautions and notes shall not contain procedural steps nor shall the headings be numbered. When a danger, warning, caution or note consists of two or more paragraphs the heading DANGER, WARNING, CAUTION, or NOTE shall not be repeated above each paragraph. If it is necessary to precede a paragraph by both a danger and a note, a warning and a note, or a caution and a note, and so forth, dangers shall precede warnings, warnings shall precede cautions, which in turn shall precede notes.

DANGER

WARNING

CAUTION

Dangers, warnings, cautions and notes shall be short, concise and used only to emphasize important or critical data. Dangers, warnings and cautions may be worded positively or negatively and shall state the hazard and result or reason, unless obvious. Paragraphs 3.4.1.8.3.1 through 3.4.1.8.3.1.4.1 provides additional requirements for inclusion of warnings and cautions. Icons shall be used as described in paragraphs 3.4.1.8.3.1 through 3.4.1.8.3.1.4.1.

3.4.1.8.3.1 Scope.
This document identifies standard practices for the inclusion of Occupational Safety and Health guidance in the text of technical manuals. The intent is to provide sufficient information to allow a standardized approach to the task, eliminate confusion, and improve the technical manual development process overall. The criteria for safety symbols in technical documents are in conformance with ANSI Z535.3.

3.4.1.8.3.1.1 General Requirements.

3.4.1.8.3.1.1.1 Human factors.
Technical manual procedures are subject to being overlooked or circumvented when they are deemed unworkable or impractical. Careful consideration of environmental factors, equipment design or layout, human nature, and other human factors will help ensure the overall integrity of the task procedures.

3.4.1.8.3.1.1.2 When to use Danger, Warning, or Caution statements.

3.4.1.8.3.1.1.2.1 Danger.
Danger is used to indicate a location, equipment, or system where imminent hazard exist, capable of producing immediate injury or death to personnel or threatens the primary mission of the ship.

3.4.1.8.3.1.1.2.2 Warning.
Warning is used to indicate a location, equipment, or system where a potential hazard exist, capable of producing injury to personnel, if approved procedures are not followed.

3.4.1.8.3.1.1.2.3 Caution.
Caution is used to indicate where hazard exist, that could severely damage equipment, a system, or the ship, causing loss of mission capability if approved procedures are not followed.

3.4.1.8.3.1.1.3 General.
Operating, maintenance, and safety instructions are used to indicate procedures to be followed in operating and maintaining equipment and complex systems normally tended by trained technicians. General safety information provides notice of general safe practice or rules related to health, first aid, sanitation and housekeeping.

3.4.1.8.3.1.1.4 Design criteria.
Danger, warning and caution icons or symbols shall be in accordance with ANSI Z535.3. These signs shall be compatible with precautions in applicable manuals.

a. As indicated by the definition in this document, DANGER statements are used to indicate imminent hazard to personnel or equipment, WARNING statements are reserved for the protection of personnel and CAUTION statements are reserved for equipment or system protection. Do not use CAUTIONS for health hazards.

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1. WARNINGS and CAUTIONS should be used for those unique conditions, steps or processes that require additional emphasis because of the inherently dangerous nature of the task or the potential for a "surprise" not otherwise readily obvious from the procedure.
2. A WARNING should be used to advise of injury or occupational illness potential, but only based on the reasonable likelihood that the reader's health or safety will be impacted in such a manner as to cause immediate concern and a disabling injury or occupational illness will result if the task procedure or stated precaution are not closely followed. Injury is defined as a traumatic bodily harm caused by a single or 1-day exposure to an external force, toxic substance (usually associated with accidents and spills in work places where the specific agent is not normally in the environment), or physical agent which will result in restricted duty, lost time, or worse. The occupational illness is defined as any abnormal physical condition or disorder, other than one resulting from an injury (as defined above), caused by repeated exposure to chemical, biological, or physical agents associated with the occupational environment which will result in restricted duty, lost time, or worse.
3. Specific direction as to which specific procedures require the use of warnings or cautions should be obtained from the LSAR and system safety. The responsible safety office also should be requested to review technical manual procedures for compliance with safety concerns.

b. Risk assessment - and the related issue of whether or not additional emphasis is required - is somewhat subjective. Decisions concerning these issues should be based on as much information as possible including historical mishap data from related systems, research, and the experience of all those involved in the technical manual development process. Often, the latter is the best indicator of the need for additional comment. Through the acquisition phase of major weapon systems, the decision to include a DANGER, WARNING or CAUTION statement in the text can often be made by consulting the Operating and Support Hazard Analysis or other system safety engineering analysis.

c. DANGERS, WARNINGS or CAUTIONS are not to be used for environmental protection concerns or security information.

3.4.1.8.3.1.1.5 Wording and Structure of Danger, Warning, and Caution Statements.

a. A DANGER, WARNING or CAUTION statement should consist of four parts: a signal word (Danger, Warning, Caution), a concise statement of the hazard, minimum precautions, and the possible result if the DANGER, WARNING or CAUTION is disregarded, unless obvious. An icon is optional. In cases where hazardous materials are being used and the conditions on 3.4.1.8.3.1.1.7e.2 exist, a hazardous material icon(s) shall be used. See paragraph 3.4.1.8.3.1.4 for guidance on constructing the icons.
   1. The signal word will always be included using one of the styles, or similar, referenced in this document. Whichever style is used, it must be used consistently.
   2. The remaining parts can be arranged in any way that gets the point across; however, following the format of statement first, precaution second, and result third is often the most clear and concise method. Brevity is important. If the possible result is obvious, it need not be included.
   3. A precaution is a short statement of hazard mitigation that tells the reader to take care, for example "use eye protection", or "keep arms and hands clear". Certain precautions may reference other publications or direct people to consult with another agency (for example, "...consult Bioenvironmental Engineering"). However, guidance of this nature should be considered for inclusion in a safety summary (see 3.4.1.8.3.1.1.7).

b. DANGER, WARNING or CAUTION statements shall never contain procedures critical to the effective and safe completion of the task. For example:

```
"WARNING

Cleaning with compressed air can create airborne
particles that may enter eyes or penetrate skin. Pressure
shall not exceed 30 psig. Wear goggles. Do not direct
compressed air against skin."
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c. Negatively worded statements (for example, "Failure to adhere..." or "Do not use ...") are acceptable and sometimes the best way to convey the message.

d. Multiparagraph or excessively long DANGER, WARNINGS and CAUTIONS are not specifically disallowed by this document but lengthy statements are a good indication that the task procedures are not written with the needed safety steps or procedures included.

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e. Pay strict attention to the definitions of "shall", "will", "should", and "may" in this document. The use of these words must be consistent with exposures or conditions which require comparable DANGER, WARNINGS or CAUTIONS.

3.4.1.8.3.1.1.6 Placement of Danger, Warning, or Caution Statements.

a. This document contains general requirements.
b. DANGER, WARNINGS or CAUTIONS should be placed in the text immediately prior to the step or procedure to which they apply. The same DANGER, WARNING or CAUTION need not be repeated within a procedure as long as the emphasis and impact of the DANGER, WARNING or CAUTION is not lost because of a break in the procedures.
c. There is no stated maximum on the number of unrelated DANGER, CAUTIONS or WARNINGS that can be placed on a page. Under no conditions should they be so numerous so as to obscure the procedures. Properly written procedures should eliminate the need for consecutive WARNINGS. Sandwiching short (one line or two line) procedures between WARNINGS and CAUTIONS should be avoided.

3.4.1.8.3.1.1.7 Safety summary sheets or sections.

a. All technical manuals containing dangers, warnings, or cautions shall have a Safety Summary. In conjunction with properly written procedures, the Safety Summary, which can contain general safety precautions, can eliminate the need for many DANGER, WARNINGS or CAUTIONS.
b. Provide a Safety Summary in accordance with this document in the front of the manual preceding the first text page. The safety summary provided on figure 1129 is only an example of the type, depth, and format of general shop safety information necessary. It is not all inclusive. Only the first two paragraphs (see figure 1129), or similar wording detailing the significance and use of DANGER, WARNING and CAUTION statements, should be considered common to all Safety Summaries. Additional paragraphs can be added depending upon the class of hazard found in the technical manual.
c. Nearly any topic can be considered for inclusion in a Safety Summary: mechanized material handling equipment; overhead lifting devices; wood or metal working machine use and guarding; and so forth. General precautions related to storage, and so forth, can also be included.
d. Safety summaries are an excellent place to provide general safety or health instructions, but they must be tailored to the technical manual.
    1. Live circuitry guidance is probably not applicable to a corrosion control technical manual. This does not preclude the possibility, however, of a WARNING in the text of a corrosion control technical manual if the text establishes the likelihood of exposure to injurious current.
    2. The converse is also true. It would be appropriate to include live circuitry guidance in the Safety Summary of a maintenance manual. However, WARNINGS inserted in the text prior to every point of potential current exposure would not be required, as long as the procedures identify the proper controls, for example, "discharge capacitor XXXX," or "...turn off power and tag out (lock out) switch." It is reasonable to assume a trained maintenance technician is fully aware of the hazards of live circuitry; emphasis beyond a Safety Summary would be needed only in the event that the equipment, procedures or work environment presented an unusual situation to the technician.
e. Inclusion of general guidance in a Safety Summary does not preclude the need for a DANGER, WARNING or CAUTION if the text calls out a nonroutine use or application.
    1. For example: in a parts cleaning technical manual, general guidance in the Safety Summary related to air pressures (30 psig), chip guarding, eye protection, and so forth, would suffice as long as the task procedures include the minimum required controls (pressure regulation, and so forth) as procedural steps. A CAUTION may still be required, however, if the text specifies 15 psig for a delicate piece of equipment that would be damaged if the technician proceeded under the general guidance included in the Safety Summary.
    2. Many industrial hygiene and occupational health concerns can be addressed in the same manner. In technical manuals that frequently call for routine solvent applications, WARNINGS would not be needed throughout the text as long as the minimum required controls are called for in the task procedures. General guidance regarding solvents could be included in the Safety Summary. Additional emphasis would then be required only if a procedure calls for a nonroutine application, such as heating the solvent, or an unusual, potentially more toxic solvent. In that event, a DANGER or WARNING could be used depending on the ability of the process to cause immediate safety or health concerns. This approach can be used for many of the occupational health concerns associated with commonly used substances, for example, hydraulic fluids, oils, fuels, paints, thinners, adhesives, sealants, and so forth.

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f. DANGER, WARNINGS or CAUTIONS should not simply be extracted from the text and inserted verbatim in a Safety Summary. An acceptable approach would be to provide a general summary of guidance, classed by exposure. DANGER, WARNINGS or CAUTIONS must still be placed in the text, however, based on the risk associated with the steps or procedure.
g. Excessively long Safety Summaries are discouraged. If a technical manual requires extensive safety or health guidance, a safety section or chapter should be considered.

3.4.1.8.3.1.2 Quality Control.

3.4.1.8.3.1.2.1 Rewrite.
The Government will recommend rewrite under the following conditions:

a. When any part of a procedure, DANGER, WARNING, CAUTION, or Safety Summary is not consistent with existing Occupational Safety and Health Administration and Service safety requirements or is detrimental to existing Service safety and health programs.
b. When WARNING statements are misused for equipment protection or otherwise misused outside of the intent of this document.
c. When CAUTION statements are misused for personnel protection, or otherwise misused outside of the intent of this document.
d. When DANGER, WARNING or CAUTION statements contain procedural steps, they should be included in the task description. Minimum protective equipment requirements or minimum precautions are allowable.
e. When DANGER, WARNING, or CAUTION statements are excessively long.
f. When DANGER, WARNING, or CAUTION statements are so numerous on a page that necessary task procedural steps are visually obscured.
g. When Safety Summaries are used to the exclusion of DANGER, WARNINGS and CAUTIONS in the text unless indicated by the nature and class of hazard associated with the text, or when otherwise used outside of the intent of this document (that is, they should provide tailored, general guidance).
h. When DANGER, WARNINGS or CAUTIONS are extracted from the text verbatim and inserted in the Safety Summary.
i. When statements detailing the significance and use of DANGER, WARNING and CAUTION statements are not provided in the Safety Summary.
j. When the wording of DANGER, WARNINGS or CAUTIONS varies throughout the text even though the same or very comparable conditions are being emphasized.
k. When a DANGER/WARNING does not serve to prevent disabling injury or death, or a DANGER/CAUTION does not serve to prevent damage or destruction of equipment.
l. When a procedure lacks required emphasis because of its inherently dangerous nature or a step requires additional emphasis because of its critical safety impact.
m. When WARNINGS or CAUTIONS contain vague precautionary statements such as "avoid all contact", or rely too frequently on references to other technical manuals or outside agencies. In these cases, inclusion in a Safety Summary or input conditions page will be recommended as appropriate.
n. When WARNING or CAUTION statements contain general safety precautions.

3.4.1.8.3.1.3 Points of Contact.

3.4.1.8.3.1.3.1 Coordination.
All those involved in the technical manual development process must remember that the OSH guidance included in technical manuals is not the only line of defense against serious mishaps, but it is sometimes the last. The effective inclusion of OSH guidance can almost never be accomplished by a single individual with a distinct background. It must be a coordinated effort among system experts, safety professionals, technical writers, and the potential user. Questions arising from this process should be referred to the appropriate Safety Office and the Government acquiring activity. Do not ignore existing contractual or Command requirements.

3.4.1.8.3.1.4 Construction of Health Hazard Icons/Safety Symbols.

3.4.1.8.3.1.4.1 Hazard Icons.
Icons/safety symbols may be used to save space in the manuals while still conveying a clear message of the hazard to the

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technician using the manual. Since the icon presents a visual image of the hazard rather than a more abstract message, recognition should be much faster than with a worded warning. ANSI Z535.3 provides general criteria for the design evaluation and use of safety symbols to identify and warn against specific hazards and provide information to avoid personnel injury and damage to equipment.

3.4.1.8.4 Form for Reporting Deficiencies.
The general information section or foreword, as applicable, of each technical manual shall provide current information on contacting distance support (anchor desk) via the web (http://www.anchordesk.navy.mil/) and via the toll free number (1-877-4-1-TOUCH [86824]). The following statement shall also be included:

"Ships, training activities, supply points, depots, Naval Shipyards and Supervisors of Shipbuilding are requested to arrange for the maximum practical use and evaluation of NAVSEA technical manuals (TMs). All errors, omissions, discrepancies, and suggestions for improvement to NAVSEA TMs shall be submitted as a Technical Manual Deficiency/Evaluation Report (TMDER). All feedback comments shall be thoroughly investigated and originators will be advised of action resulting there from.

(Use this statement for printed hard copy TMs) Three copies of the NAVSEA/SPAWAR Technical Manual Deficiency/Evaluation Report form, NAVSEA 4160/1 are included at the end of each separately bound hardcopy TM.

(Use this statement for a TM on CD-ROM) The NAVSEA/SPAWAR Technical Manual Deficiency/Evaluation Report form, NAVSEA 4160/1 is included as the last page of the TM.

(Include this statement for all TMs) Copies of form NAVSEA 4160/1 may also be downloaded from:
https://nsdsa2.phdnswc.navy.mil/tmmp/forms/TMDER_BLANK_REV_7-2003.doc

The following methods are available for generation and submission of TMDERs:

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- The most expedient and preferred method of TMDER generation and submission
  is via the Technical Data Management Information System (TDMIS) website at:
  https://mercury.tdmis.navy.mil
  TDMIS accounts can be requested at:
  https://nsdsa2.phdnswc.navy.mil/
- Generate and submit TMDER via the Naval Systems Data Support Activity (NSDSA)
  website at:  https://nsdsa2.phdnswc.navy.mil/tmder/tmder-generate.asp?lvl=1
- When internet access is not available, submit TMDER via hardcopy to:
      COMMANDER
      CODE 310 TMDERs
      NAVSURFWARCENDIV NSDSA
      4363 MISSILE WAY, BLDG 1389
      PORT HUENEME, CA 93043-4307
- TMDERs against classified TMs must be submitted using the hardcopy method cited above.
- Urgent priority TM deficiencies shall be reported by Naval message with transmission to
  Port Hueneme Division, Naval Surface Warfare Center (Code 310), Port Hueneme, CA.
  Local message handling procedures shall be used.  The message shall identify each TM
  deficiency by TM identification number and title.  This method shall be used in those
  instances where a TM deficiency constitutes an urgent problem, (i.e., involves a
  condition, which if not corrected, could result in injury to personnel, damage to the
  equipment or, jeopardy to the safety or success of the mission).
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Complete instructions for TMDER generation and submission are detailed on the NSDSA website at:
https://nsdsa2.phdnswc.navy.mil/tmder/tmder.asp?lvl=1

3.4.1.8.5 Lubrication Instructions.
If provided, separate lubrication charts or instructions shall be included in the manual. All lubricants, fluids, and associated products identified in the manual, supplemental data, or separate lubrication chart must have a Government identifier, (military specification number, NSN, and so forth) or manufacturer and part number which identifies the product beyond the product name and provides the user with requisitioning information.

3.4.1.8.6 Spare and Repair Parts.
If required, the COTS manuals shall be supplemented with applicable spare and repair parts breakdown information. Supplemental data shall not duplicate data in the existing manual. The parts breakdown data shall be presented in contractor

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format and in the following order:

a. Introduction (Section I).
b. Parts list and illustrations (Section II).
c. Special support equipment list and illustrations (Section III).
d. Cross-reference indices (Section IV).

3.4.1.8.6.1 Introduction - Section I.
The introduction shall contain how-to-use information. The introduction shall explain the use of the parts equipment breakdown listings and the reference indices. The column headings, symbols, abbreviations, codings, notes, and other data used shall be explained in detail.

3.4.1.8.6.2 Parts List and Illustrations - Section II.
All spare and repair parts shall be listed by assembly. They shall be shown on the associated parts breakdown illustration. Unless otherwise specified, these assembly illustrations and parts lists shall be arranged in top-down breakdown (next higher assembly) sequence.

3.4.1.8.6.2.1 Illustrations.
Illustrations shall be detailed line drawings and identify all repairable or replaceable parts. Each assembly illustration (or set of illustrations, if multi-sheets) shall precede the associated parts listing. Exploded views shall be provided when specified. Figures shall be numbered in ascending numerical sequence, and each item illustrated shall be assigned an item or index number. Item or index numbers shall be arranged in numerical clockwise sequence. Leader lines, with arrowheads, shall be drawn from each of the callouts (item or index number) to the items.

3.4.1.8.6.2.2 Parts List.
The parts list for the associated illustration shall bear the same title as the illustration and shall contain the columns listed:

a. Column (1), FIGURE-ITEM NO.
b. Column (2), SOURCE, MAINTENANCE AND RECOVERABILITY (SM&R) CODE.
c. Column (3), CAGE (Commercial and Government Entity) Code per H4/H8.
d. Column (4), PART NO. (actual manufacturers, vendors part, drawing, and military specification number).
e. Column (5), DESCRIPTION AND USABLE ON CODE (UOC) (item name and provisioning nomenclature (if required) and UOC (when more than one model or configuration is covered in the manual)).
f. Column (6), QTY (amount or number per figure or assembly).

3.4.1.8.6.3 Special Support Equipment List and Illustrations - Section III.
This section shall include special tools, test equipment, and special support equipment. Each tool or equipment shall be illustrated and a list prepared in the same format as for the parts list in Section II. The basis of issue shall be stated for each kit or set on the last line of the Description and Usable on Code column. The basis of issue, (BOI) provided by the Government, shall state the quantity per unit, division, company (CO), battery or other organizational structure or division, for example, BOI: 1 PER LETTERED CO. Items listed as part of a kit or set shall be shown as quantity per kit or set as applicable, and the BOI for the kit or set shall be stated for the kit or set line item entry.

3.4.1.8.6.4 Cross-Reference Indices - Section IV.
Unless otherwise specified, this section shall include the following indices in the order presented:

a. Figure and item number index. This index, keyed on figure and item number in numerical sequence, shall cross-reference applicable CAGE Code number, part number, and the NSN.
b. Part number index. This index shall key on part number in alphanumeric sequence and reference applicable CAGE Code, NSN, figure, and item number.
c. NSN index. This index shall list the NSN by ascending national item identification number, (the last nine digits). The NSN shall reference the applicable figure and item number.
d. Reference designator index. When figures or illustrations, such as electronic circuit diagrams, use reference designators in lieu of item numbers, an index listed by reference number in alphanumerical order shall cross-reference the applicable figure and item numbers.
e. Original equipment manufacturer (OEM) or true vendor. When applicable, the OEM part number shall be cross-

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referenced to true vendor part number. The part numbers shall be in alpha numeric sequence.

3.4.1.9 Accuracy.
Essential corrections or changes to the manual shall be included in the supplemental data. Accuracy includes the requirements that the technical manual reflect the "as built" or "as is" configuration of the associated hardware.

3.5 Final Reproducible Copy.
A final document shall be developed ready for reproduction and publication as an authenticated technical manual including all necessary changes made as a result of validation or verification procedures and Government conditions of acceptance or approval. The delivery media shall include, but will not be limited to, reproducible camera-ready copy, direct image copies, digital text and graphic files, disks, tapes, and so forth.

The FRC shall have the following minimum acceptable features:

a. Single spacing.
b. Justified right margins.

4.0 QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for Inspection.
The contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

5.0 PACKAGING.

5.1 TECHNICAL MANUAL SCHEDULE, STATUS AND COSTS REPORTS.
Suggested packaging is commercial in accordance with ASTM D3951. Delivery shall be in accordance with the Contract Data Requirements List.

5.2 QUALITY ASSURANCE PROVISIONS.

5.2.1 Validation Plan.
Suggested packaging is commercial in accordance with ASTM D3951. Delivery shall be in accordance with the Contract Data Requirements List.

5.2.2 Validation Certification.
Suggested packaging is commercial in accordance with ASTM D3951. Delivery shall be in accordance with the Contract Data Requirements List.

5.3 COMMERCIAL OFF-THE-SHELF (COTS) EQUIPMENT MANUALS.
Unless otherwise specified, suggested packaging is commercial in accordance with ASTM D3951.

5.4 SUPPLEMENTAL DATA.

5.5 Final Reproducible Copy (FRC).
Suggested packaging is commercial in accordance with ASTM D3951.

6.0 GOVERNMENT FURNISHED PROPERTY.

7.0 COST AND PRICING.

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Not applicable.

8.0 PRINTING.

8.1 Authorization.
Joint Committee on Printing (JCP), Congress of the United States Authorization 23383 permits procurement of cold-type composition and photolithographic negatives under Government contracts. Accordingly, such authority is invoked in this contract. The printing of final technical manuals shall be accomplished by the Government.

9.0 NOTES.
The Figure List referenced in this document is by ascending order which is not necessarily the order of appearance. Only those figures referenced by the requirements of this document are included which accounts for the non-sequential listing. The figures are samples only. Size and legibility do not necessarily conform to the requirements set forth herein.

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