

MIL-HDBK-288 (MC)

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MILITARY HANDBOOK

REVIEW AND ACCEPTANCE OF ENGINEERING DRAWING PACKAGES



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DEPARTMENT OF THE NAVY
UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

Review and Acceptance of Engineering Drawing Packages

1. This standardization handbook was developed by the United States Marine Corps.
2. This handbook supplements DOD-STD-100, DOD-D-1000, and other applicable documents. It provides information and a recommended procedure for reviewing and accepting or rejecting engineering drawing packages.
3. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commandant of the Marine Corps (Code LMA-1) Headquarters, U. S. Marine Corps, Washington, D.C. 20380, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FOREWORD

A substantial percentage of contract dollars is spent on technical data. The engineering drawing package (EDP) is one of the most expensive data items purchased in the course of a system's acquisition. The EDP is used to evaluate and validate a design concept, to maintain proper configuration control, to support quality assurance functions, to provide technical data for competitive reprourement of spares and end items, and as the major source of technical information for logistics support throughout a system's lifecycle. The EDP, supplemented by equipment specifications and quality assurance procedures, should contain enough information to allow any competent manufacturer to purchase materials and components, manufacture, test, inspect, and deliver articles identical to or interchangeable with those delivered by any other manufacturer using the same EDP. The EDP should not require any additional data, instructions, manuals, company or industry standards to fulfill its intended purpose.

Discrepancies in the EDP, or limitations placed on its use, can lead to the procurement of unusable spare parts, unreliable or inoperative equipment, or multiple configurations of the same item. A poor EDP can also prevent competitive reprourement of spares and end items due to technical difficulties and high cost. It is imperative that EDP's procured in support of DOD materiel acquisitions be reviewed and audited for accuracy, adequacy, and completeness. An EDP is validated by using it in the manufacture, inspection, and test of the items it depicts. Unless otherwise specified in the procurement contract, the manufacturer validates the data furnished to the Government. An EDP is verified by Government monitoring during drawing preparation, technical reviews of completed drawings, and configuration audits. Verifications are normally performed by the Government to ensure compliance with contract data requirements, and are limited to level 2 and level 3 EDP's.

This handbook details procedures to be followed in monitoring and reviewing EDP production, and provides guidance to the drawing reviewer concerning what to look for when reviewing an EDP. This handbook also provides a method for documenting and reporting the discrepancies discovered during EDP reviews.

This handbook is not designed to supersede the requirements contained in other specifications or standards. Nor is it an attempt to combine all of the detailed quality assurance requirements from the individual specifications and standards

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into one document. This handbook is designed as an aid in performing EDP reviews by reminding the reviewer of some of the more important requirements to be looked at on the more frequently encountered drawings.

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1. SCOPE

1.1 Purpose. The purpose of this handbook is to provide guidance on the review of engineering drawing packages (EDP's).

1.2 Scope. This handbook provides a method to review and document the review of EDP's.

1.3 Applicability. The information contained in Section 5 is intended to be selectively applied to the review of specific EDP's.

1.4 Application guidance. The contents of this handbook guide the user in reviewing level 2 and level 3 engineering drawings of military equipment. The Government or an authorized representative shall review EDP's during the full-scale engineering development and production/deployment phases of system acquisitions. When tailoring the methods and information in this handbook to the review of specific EDP's, follow these principals:

- a. Every system is different, and so is every EDP. The number and types of drawings in an EDP vary according to the system they depict. Thus, the number and types of drawings to be reviewed vary from one system acquisition to another.
- b. The techniques and standards used to review an EDP must be tailored to the type of design an EDP depicts. For example, the review of a wiring diagram requires a completely different approach than the review of an assembly drawing of a mechanical system. Section 5 is written with this in mind.

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2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation form a part of this handbook to the extent specified herein (see 2.4.1).

SPECIFICATIONS
MILITARY

DOD-D-1000	Drawings, Engineering and Associated Lists
MIL-D-5480	Data, Engineering and Technical, Reproduction Requirements for
MIL-D-8510	Drawings, Undimensioned, Reproducibles, Photographic and Contact, Preparation of
MIL-M-9868	Microfilming of Engineering Documents, 35mm, Requirements For
MIL-C-9877	Cards, Aperture
MIL-D-18300	Design Data Requirements For Avionic Equipment
MIL-M-38761	Microfilming and Photographing of Engineering/Technical Data and Related Documents, PCAM Card Preparation, Engineering Data Micro-Reproduction System, General Requirements for, Preparation of

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STANDARDS
MILITARY

DOD-STD-100	Engineering Drawing Practices
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-275	Printing Wiring for Electronic Equipment
MIL-STD-804	Format and Coding of Tabulating and Aperture Cards for EDMS

2.1.2 Other Government documents and publications. The following other Government documents and publications form a part of this handbook to the extent specified herein (see 2.4.2).

H6-1	Federal Item Name Directory for Supply Cataloging
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2.2. Other publications. The following documents form a part of this handbook to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. The issues of documents which have not been adopted shall be those in effect on the date of the cited DODISS (see 2.4.3).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI-Y14.1	Drawing Sheet Size and Format
ANSI-Y14.3	Multi and Sectional View Drawings, Engineering Drawing and Related Documentation Practices
ANSI-Y14.5	Dimensioning and Tolerancing for Engineering Drawings
ANSI-Y14.6	Screw Thread Representation, Engineering Drawing and Related Documentation Practices

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ANSI-Y14.7.1	Gear Drawing Standards, Part 1
ANSI-Y14.7.2	Gear Drawing Standards, Part 2
ANSI-Y14.15	Electrical and Electronic Diagrams
ANSI/IPC-D-350B	Printed Board Description in Digital Form

2.3 Order of precedence. In the event of a conflict between the text of this handbook and the references cited herein, the text of this handbook shall take precedence.

2.4 Source of documents.

2.4.1 Government specifications, standards, and handbooks. Copies of the referenced federal and military specifications, standards, and handbooks are available from the Department of Defense Single Stock Point, Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. For specific acquisition functions, these documents should be obtained from the contracting activity or as directed by the contracting activity.

2.4.2 Other Government documents. Copies of other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity. The documents listed may be obtained as follows:

- a. Copies of H6-1 should be obtained from the Government Printing Office, Washington, D.C. 20402.

2.4.3 Sources for nongovernment publications. Nongovernment documents are generally available for reference from libraries and technical groups. The documents listed may be obtained as follows:

- a. ANSI: Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

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3. DEFINITIONS

3.1 Altered item drawing. An engineering drawing which depicts the alteration of an existing item from its original configuration. An altered item drawing depicts complete details of the alteration.

3.2 Assembly drawing. An engineering drawing that depicts a number of parts or subassemblies joined together to perform a specific function. An assembly drawing depicts the details of how the parts or subassemblies are joined and interact.

3.3 Associated list. A tabulation of pertinent engineering information pertaining to an item depicted on an engineering drawing or a set of engineering drawings. Examples include parts lists, index lists, and data lists.

3.4 Commercial item. An article regularly used for other than Government purposes, which is sold or traded in the course of normal business operations.

3.5 Contract data requirements list (CDRL). A list of data requirements that are authorized for, and made part of, a specific contract. The CDRL is prepared on DD Form 1423.

3.6 Contracting officer. Any person granted the authority to enter into and administer contracts on behalf of a Government agency. The term includes any individual who is delegated such authority.

3.7 Contractor. Any individual, partnership, public or private corporation, association, institution, or other entity which enters into a contract with the Government.

3.8 Data item description (DID). A description of an item of data required by the Government which defines the content, preparation instructions, format, and intended use of the data product. The DID is prepared on DD Form 1664, and becomes part of the CDRL.

3.9 Design activity. A Government activity or a contractor which is responsible for the design of an item.

3.10 Detailed drawing. An engineering drawing which depicts one or more details of an item or assembly.

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3.11 Engineering drawing. A document which graphically depicts engineering data pertaining to an item or assembly.

3.12 Engineering drawing package (EDP). A collection of engineering drawings, associated lists and documents, manufacturer specifications and standards, or other information relating to the design and manufacture of an item or system.

3.13 Engineering study (ES). A document prepared by the reviewing activity that documents discrepancies noted during an in-process or final review of an EDP.

3.14 Reviewing activity. The Government activity assigned to perform in-process or final technical reviews of EDP's.

3.15 Selected item drawing. An engineering drawing that depicts an existing standard, or design, or vendor activity item upon which further required selection or restriction for fit, tolerance, performance or reliability is placed. (See DOD-STD-100 for complete requirements.)

3.16 Source control drawing. An engineering drawing that depicts an existing commercial or vendor item which exclusively provides the performance, installation, and interchangeable characteristics required for one or more specific critical applications. (See DOD-STD-100 for complete requirements.)

3.17 Specification control drawing. An engineering drawing that depicts an existing commercial vendor-developed item advertised or catalogued as available on an unrestricted basis on order as an off-the-shelf item; or an item, while not commercially available, is procurable on order from a specialized segment of industry. (See DOD-STD-100 for complete requirements.)

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4. GENERAL REQUIREMENTS

4.1 EDP. If not already in existence, some form of engineering drawing will be prepared by the manufacturer or system developer at the start of a program. During the concept/exploration and demonstration/validation stages of system development, the drawing package may contain only enough detail to permit design evaluations and cost projections. As the design progresses and the program moves through full scale engineering development and finally into production, the drawings become more and more detailed. The drawing levels described in DOD-D-1000 enable the EDP to follow this progression from design concept to production. They are: level 1, Conceptual or Development Design; level 2, Production Prototype or Limited Production; and level 3, Production.

4.2 Reviewing the EDP. From its inception to its disposal, the EDP is a dynamic set of documents. As a program progresses, design changes are made, manufacturing difficulties are encountered, technology changes, and drawing errors are located. All of these events require the design activity to change the EDP. Regardless of the reason for changes, the EDP must be continuously reviewed to ensure that it accurately depicts the article in its current configuration.

4.3 Principal phases of EDP reviews. The principal phases of the review process for EDP's are:

- a. Selection of reviewing activity and review of contract requirements.
- b. Contractor indoctrination.
- c. Technical reviews.
- d. Documenting discrepant EDP's.
- e. Final review.
- f. Recommending acceptance or rejection of the EDP.

4.4 Reviewing activity.

4.4.1 Familiarity with requirements. Everyone who reviews EDP's should become thoroughly familiar with the drawing requirements in applicable Government specifications and standards. This handbook aids in performing EDP reviews by reminding the

reviewer of some of the more important requirements to be reviewed on the most frequently encountered drawings. EDP's should be reviewed by experts in the type of item or assembly depicted.

4.4.2 Reviewing the CDRL. The contract is the most important document controlling the EDP. Each requirement for the EDP is prepared in the form of a DID on DD Form 1664. The DID's are listed on a CDRL, DD Form 1423, which is appended to the contract. It is essential that the DID's and the CDRL adequately and accurately describe the requirements for the EDP, including level of drawings, tailoring requirements, associated lists, formats, and delivery schedules. The persons assigned to review an EDP should first review each DID and CDRL and become familiar with the contract and what it requires the contractor to deliver to the Government.

4.5 Contractor indoctrination. Government personnel assigned to perform the technical review of the EDP must understand the contract, and the contractor must agree with them on what is required for each deliverable. Both parties should meet as early in the contract period as possible and review contract requirements together. Any disagreement over the interpretation of the contract should immediately be brought to the attention of the procuring activity's program office for resolution. This indoctrination may not be needed when follow-on contracts are awarded to the same contractor, or when the contractor is already working on more than one project for the same Government procuring activity. The reviewing activity and the contractor should discuss the following topics when they meet:

- a. The contractor's drafting practices and drawing formats.
- b. The contractor's quality assurance procedures for preparing, checking, and revising EDP's.
- c. Types of lists (index, data, and parts) to be furnished.
- d. Approximate number of drawings to be furnished.
- e. Security classification of drawings or data.
- f. Contractor proprietary rights over any drawing or associated document in the EDP. The contract must specify the extent of contractor rights-in-data.

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- g. Whether the contractor plans to use existing drawings or data as part of the EDP. If so, ensure that they are acceptable to the Government.
- h. Types of drawings to be furnished by the contractor for off-the-shelf items.
- i. Under what conditions specification and source control drawings shall be used and will be accepted.
- j. If wire harness drawings will be furnished under the contract. If so, consider using them as templates for making wire harnesses, in order to reduce manufacturing costs.
- k. Types of drawings to be used for documenting printed circuits.
- l. The use of Government and industry standard parts whenever possible.
- m. Contractor provisions for test specifications in the EDP.
- n. Procedures for incorporating approved engineering changes in the EDP.
- o. Whether the EDP will be used as supplementary provisioning technical documentation.
- p. Subcontracting of drawing requirements to other contractors, if applicable. The prime contractor shall ensure that subcontractor drawings conform to contract requirements.
- q. Government procedures for reviewing the EDP and documenting deficiencies.
- r. Contractor procedures and time limit to respond to Government comments and correct deficiencies in the EDP.

4.6 Technical reviews of the EDP. Government agencies conduct in-process technical reviews to monitor the preparation of EDP's and to evaluate the technical content of individual drawings or entire EDP's.

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4.6.1 Surveillance of drawing preparation. It is essential that the Defense Contract Administrative Service (DCAS) or other Government reviewing activity monitor drawing preparation. An active drawing surveillance program brings technical or managerial problems to light early in the acquisition program, thus avoiding potentially costly and time-consuming errors. The surveillance program should include inspections of procurement, manufacturing, and test facilities to ensure that the drawings, or documents developed from the drawings, are used in the functions for which they are prepared.

4.6.2 Reviewing for technical content. Technical reviews of engineering drawings vary according to the type and level of drawings and the system or item they depict. Section 5 contains guidance for reviewing the most frequently encountered types of engineering drawings and associated lists. Each reviewing activity should establish its own acceptable quality level for EDP reviews in accordance with MIL-STD-105. Normally, a detailed review of 15 percent to 20 percent of the total package is sufficient to reveal the types of deficiencies to be found throughout. However, reviewing activities may elect to conduct more extensive reviews of smaller or extremely complex drawing packages. All drawings should be reviewed for compliance with rights-in-data clauses of the contract. Any drawings found to be noncompliant shall be rejected. Before reviewing an entire EDP or all the drawings for an entire assembly, first conduct a completeness review to ensure that all required drawings and supporting data have been furnished. See 4.9.1 for instructions on how to conduct a completeness review.

4.6.3 Follow-on review. The Government reviewing activity should meet with the contractor as needed to discuss, explain, and resolve the discrepancies noted in the ES (see 4.7). The contractor shall revise the drawings as required and submit corrected drawings to the Government for review. The Government reviewing activity shall conduct follow-on reviews of new or corrected engineering drawings to ensure that they are acceptable. Additional engineering studies should be prepared as needed to document discrepancies noted in follow-on reviews. Any discrepancies that cannot be resolved should immediately be brought to the attention of the project manager of the procuring activity. During this review cycle, the reviewing activity should coordinate with the activity performing or witnessing configuration audits to ensure that all drawing discrepancies noted during the audits are corrected.

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4.7 ES. Once the Government reviewing activity has completed its technical review, it shall prepare an ES to document its findings. The ES lists all discrepancies discovered during the technical review. See 5.7 for detailed guidance on how to prepare and distribute an ES.

4.8 Final review. The final review is conducted on the contractor's final deliverable under the contract. The final deliverable, which may be in the form of original drawings, microfilm/aperture cards, nonreproducible hardcopies, or any combination thereof, should not be submitted to the Government until the technical reviews have been completed and the drawings found technically acceptable. The final review should ensure the following:

- a. Previously documented discrepancies have been corrected,
- b. The final deliverable is a complete package, and
- c. The media on which the final deliverable is submitted conforms to the contractual requirements. the final review should not, but might, result in preparation of an ES.

4.8.1 Review of previously documented discrepancies. A sampling of the final deliverable should be reviewed to ensure that previously documented discrepancies, which the contractor had agreed to correct, were in fact corrected. ES's from previous technical reviews should be used as guides to verify the correction of previously noted discrepancies.

4.8.2 Review for completeness. Also known as a top-down-break-down (TDBD), the completeness review is performed to ensure that the EDP contains all the documents necessary to produce the system or items depicted. The TDBD is begun by examining the engineering drawing which depicts the entire assembly, end item, or system. This first-tier, or top drawing, lists second-order documents such as detail drawings, parts lists, and specifications. These second tier documents may be listed in drawing notes, parts lists, material blocks, or anywhere else on the face of the drawing. Therefore, a review of parts lists alone is not sufficient to complete a TDBD. Each lower tier document may in turn list additional drawings, lists, or specifications. Each must be reviewed in the same manner, until all documents belonging to the EDP have been examined. An index list, data list, or indentured (used on) list can be helpful in performing the TDBD. If none of these lists are available, a list can be

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hand-generated to keep track of all cross-references. All documents cited in a drawing or associated list shall be furnished as part of the EDP except for industry specifications and standards, military specifications and standards, or documents referenced parenthetically. The drawing package is not complete unless this requirement is met. The EDP should also be checked against the requirements of the CDRL and the standardization documents cited in each applicable DID. This review is not conducted for technical substance, but rather to identify and locate all documents required by the contract.

4.8.3 Review of drawing media. This review is conducted to ensure that the media materials, legibility, and reproductive quality conform to the applicable contract requirements and specifications.

4.8.3.1 Original drawings. If the contract specifies original drawings as the final deliverable, a sampling of the package should be examined for compliance with MIL-D-5480, MIL-D-8510 and DOD-STD-100. Particular attention should be paid to the legibility of lines, numbers, letters and character data, and to the reproducibility of the drawings. The reviewing activity should also ensure that when original drawings are ordered, original drawings are received. Duplicate originals shall not be delivered to the Government (see DOD-STD-100).

4.8.3.2 Master pattern drawings. When the contract requires master patterns to be delivered as part of the drawing package, they should be reviewed for compliance with DOD-STD-100 and MIL-STD-275.

4.8.3.3 Microfilm/aperture cards. If the contract specifies a final deliverable in the form of microfilm copies of the drawing package mounted in aperture cards, the media should be reviewed for compliance with MIL-M-9868, MIL-C-9877, MIL-M-38761, and MIL-STD-804. A sampling of the microfilm should be examined to ensure that the type, class, and kind (if applicable) are in accordance with MIL-M-9868 as contractually imposed. The entire microfilm package should be reviewed for quality, density, and resolution. Aperture cards should be reviewed to ensure that they are of the correct type, class, and kind; that the microfilm is mounted correctly; that the header information printed on the card reflects the drawing depicted on the microfilm; and that the information punched on the card agrees with the header information.

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4.9 Recommending acceptance or rejection.

4.9.1 Acceptance of the EDP. The Government reviewing activity shall ensure that both the technical and final reviews of the EDP have been completed before recommending acceptance. If the reviewing activity determines that the engineering drawing package meets contract and specification requirements, it shall notify the designated accepting activity in writing. The accepting activity, which is listed as the first addressee on block 14 of the CDRL, shall notify the contractor that the EDP has been accepted. This is done by signing the DD Form 250.

4.9.2 Rejection of the EDP. The EDP should be rejected if in-process, technical, or final reviews reveal that it does not meet the acceptable quality level specified by the reviewing/procuring activity. If the reviewing activity recommends rejection, it shall notify the designated accepting activity by letter, with a copy of the ES to justify its recommendation. When the reviewing activity recommends rejection, the contracting officer may elect to invoke the withholding of payment clause in the contract. The contracting officer shall notify the contractor by letter that the EDP has been rejected, and attach a copy of the ES as justification. In any event, the contractor should be allowed a reasonable period, specified in the CDRL, to correct the EDP and resubmit it for Government review/acceptance.

4.10 General guidance for reviewing EDP's. The following items should be reviewed on all level 2 and 3 engineering drawings:

<u>Topic</u>	<u>Controlling Document</u>
a. Drawing size and format	DOD-STD-100
b. Drawing title (nomenclature)	DOD-STD-100 H6-1
c. Drawing number	DOD-STD-100
d. Authorized signatures	ANSI-Y14.1
e. Scale	DOD-STD-100
f. Contract number in title block	DOD-D-1000

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g.	Applications blocks	ANSI-Y14.1
h.	Sheet numbering	DOD-STD-100 ANSI-Y14.1
i.	Zoning	ANSI-Y14.1
j.	Security classification	DOD-STD-100
p.	Lettering	DOD-STD-100
q.	Legibility	DOD-D-1000
r.	Dimensions and tolerances	DOD-STD-100
s.	Graphic symbols	DOD-STD-100
t.	Abbreviations	DOD-STD-100
u.	Items covered by Government or industry standards	DOD-D-1000
v.	Identification of rights in data (limited rights legends)	DOD-D-1000
w.	Reference dimensions	ANSI-Y14.5
x.	Existing drawings, use and submission	DOD-D-1000
y.	Part numbers	DOD-STD-100
z.	Part marking	MIL-STD-130
aa.	Company standard documents	DOD-D-1000
bb.	Reference documents	DOD-D-1000
cc.	Standard supply system items used wherever possible	DOD-D-1000

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5. DETAILED REQUIREMENTS

5.1 Reviewing for correct material and mechanical specifications.5.1.1 Material specifications. See DOD-STD-100.

- a. Make sure that material specifications are listed on the drawing.
- b. Check material specifications. Ensure requirements such as class, grade, and type are specified. Ensure active specifications are used.
- c. Ensure that the material specification correctly identifies the shape required, such as bar, sheet, rod, or tubing.
- d. The tolerances and surface finishes given on specifications for commercial items must agree with those shown on the drawing for nonmachined dimensions.
- e. Evaluate qualities in regards to plating, painting, welding and hardening.
- f. Industry standard stock materials must be specified, when practical.
- g. Ensure that proper material is used on die formed parts. Some heat treated materials are not practical for die forming. Other materials are suitable and aging will meet hardness requirements.
- h. Ensure that material has been specified in the proper condition to facilitate machining operations.
- i. Check the type of raw material for compatibility with processing and machining techniques, stress requirements, and direct contact with dissimilar materials.
- j. Check the drawing notes for heat treatment and hardness specifications and requirements.

5.1.2 Castings and forgings. Check the following items:

- a. Ensure that there are separate views of a rough casting or forging and the finished part.

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- b. Make sure that the drawings specify the type of forging or casting to be used.
- c. Ensure the drawings specify draft allowances.
- d. Specified tolerances must be compatible with the type of casting or forging and its intended use.
- e. Datum planes must be specified.
- f. Ensure that the location and dimensions of tooling points are specified.
- g. Dimensions of draft surfaces must be taken from mold lines.
- h. Duplicate dimensions should not be shown on both the rough and finished part drawing unless one of the dimensions is marked "FOR REFERENCE."
- i. Ensure that the grain direction of forging is indicated on the drawing.
- j. Ensure that all materials, including alloys, are properly specified. See DOD-STD-100.
- k. Ensure that drawings specify the parting lines of castings.
- l. Ensure that the drawings show the location and dimensions of test coupons on forgings or castings.
- m. Ensure that inspection procedures are specified for the castings or forgings shown on the drawings.

5.1.3 Mechanical specifications. See DOD-STD-100.

5.1.3.1 General requirements.

- a. Check fits between all mating parts to ensure that maximum tolerance build-ups will allow parts to assemble and operate without interference.
- b. Check all dimensions to ensure that material can be machined with standard tools.

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- c. All machining requirements such as chamfers, countersinks, counterbores, and radius must be properly defined and specified.
- d. Check to ensure that all mating holes for connecting hardware such as rivets and bolts are within tolerance limits.
- e. Ensure that lubrication fittings have been provided, as needed, at convenient and accessible places.

5.1.3.2 Thread data. See ANSI-Y14.6. Check thread data for the following:

- a. Ensure that pipe threads are not used as pressure seals.
- b. Ensure adequate thread engagement. Bolts must be long enough to provide sufficient thread engagement for washers, nuts, and safety wire, as appropriate.
- c. Countersunk or chamfered first thread.
- d. Check uniformity in depth of tap drills and thread depth for greater efficiency in production. Blind tap holes should be avoided.

5.1.3.3 Spring data. Check spring data for the following information:

- a. Ensure that the drawings specify the type of springs to be used.
- b. Wherever possible, springs that conform to an accepted Government or industry specification or standard should be used.
- c. Where nonstandard springs are used, ensure that the drawings depict their wire diameter, mean spring diameter, spring rate, unstressed length, stressed length, and finish.

5.1.3.4 Gear data. See ANSI-Y14.7.1 and ANSI-Y14.7.2. Check gear data for the following:

- a. Ensure that drawings specify the type of gears to be used.

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- b. Wherever possible, gears that conform to an accepted Government or industry specification or standard should be used.
- c. Where nonstandard gears are used, ensure that the drawings depict their pitch, pitch diameter, shaft diameter, thickness, material used, finish, and any special lubrication requirements.

5.1.3.5 Bearing data. Check bearing data for the following information:

- a. Ensure that the drawings describe the types of bearing to be used and their rating life.
- b. Wherever possible, bearings that conform to an accepted Government or industry standard or specification should be used.
- c. Where nonstandard bearings are used, ensure that the drawings describe their dimensions, load rating, speed, and lubrication requirements.

5.1.4 Sheet metal data. Check for the minimum bend allowance and dimensions of parts formed from sheet metal. Drawings should show dimensions from outside mold lines. To eliminate the need for calculations, drawings should show the true dimensions of bend allowances instead of angle dimensions. See ANSI-Y14.5. Complicated sheet metal and weldment parts should be replaced with die and investment castings wherever practical. Evaluate stamping, extruding or fabricating in lieu of casting and forgings. Ensure that welding requirements conform to applicable standards.

5.1.5 Plating and finishing data. Check plating and finishing requirements for the following:

- a. Ensure that tolerance and thickness of plating is in accordance with the applicable specification.
- b. The drawings must specify the dimensions and surface finish requirements of plated parts.
- c. Precious metal plating requirements should be eliminated where practical to reduce cost.

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- d. Avoid plating only selected portions of parts wherever possible.
- e. Drawings must specify if metal parts will be deoxidized, anodized, chemically filmed, barrier coated, sacrificial coated, or treated in some other manner. If more than one treatment method is specified, ensure that the treatments are applied in the proper order.
- f. Check drawing notes to make sure that magnetic inspection is required for high stress heat treated parts and low microfinish parts prior to grinding.

5.2 Reviewing assembly drawings. Check the following:

- a. Ensure that the locations of name plates are shown.
- b. Assembly drawings must show all peculiar assembly or adjustment instructions.
- c. Ensure that the assembly drawings refer to all associated documents and drawings.
- d. There must be sufficient views to show the relationship between each part.
- e. Assembly part numbers must be properly marked.
- f. Assembly drawings must show tolerances for output and input connections.
- g. Ensure that inspection and test requirements are specified for items depicted in the drawing. See DOD-D-1000.
- h. Assembly drawings must identify inseparable assemblies.
- i. Ensure that assembly drawings identify and depict attaching hardware such as nuts, bolts, and rivets.
- j. Location and orientation of parts must be shown.
- k. Ensure that tolerance buildups do not cause interference during assembly, disassembly and operation.
- l. Ensure that required quantities are correct.

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- m. Assembly drawings must depict correct assembly and reference dimensions.
- n. Ensure that the reference designators used on the assembly drawing are used consistently on all associated drawings and related lists.
- o. The identification and quantity of parts shown on the assembly drawing must agree with the parts lists.

5.3 Reviewing detailed drawings. See ANSI-Y14.3. Check the following:

- a. Detailed drawings must completely depict the entire part or assembly shown.
- b. Ensure that there are sufficient views to adequately define the item.
- c. Ensure that all dimensions are taken from physical features. See ANSI-Y14.5.
- d. Detail drawings should not show the dimensions of hidden lines. See ANSI-Y14.5.
- e. Ensure that datum planes are properly defined. See ANSI-Y14.5.
- f. Ensure that mono-detail drawings depict only one item.

5.4 Reviewing drawings of electrical and electronic systems.

5.4.1 General. See DOD-STD-100 and ANSI-Y14.15. Review all drawings of electrical and electronic systems for the following information:

- a. Ensure that wires are properly identified by size, specifications, and coding.
- b. Sleeving must be properly identified. Sleeving should be over connections to ensure adequate protection where a possibility of shorting exists.
- c. Check notes for correct soldering specifications.
- d. Check that floating connectors are used only where necessary.

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- e. Check for conformal coating, where required, to provide adequate resistance to leakage.
- f. Check that the drawings show the polarity of diodes and crystals.
- g. The orientation of transistors and other parts must be specified with respect to a fixed reference point.
- h. Check for hermetic sealing of connectors, where required.
- i. Check to see that requirements for lacing, sleeving or wrapping are identified.
- j. Analyze and evaluate assembly drawings, wiring diagrams, printed wiring board drawings, and schematic diagrams for compatibility. Each drawing or diagram should refer to all related drawings or diagrams. All reference designators must be consistent.
- k. Analyze and evaluate the service rating on all connectors. Ensure that all connectors are compatible.
- l. Analyze and evaluate all components for safety.
- m. All levels of electrical or electronic assembly drawings must adequately describe the test requirements for the items they depict.

5.4.2 Wiring diagrams and wiring harness drawings. Check the following:

- a. Wiring diagrams and wiring harness drawings should be used where appropriate. See DOD-STD-100.
- b. The physical arrangement of wire routing components should be consistent with their layout in associated drawings.
- c. Ensure that component terminals are identified in wiring diagrams. Drawings must conform to Section 4 of MIL-STD-275.
- d. Ensure that the use of reference designators is consistent with related drawings.

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- e. Ensure that wiring diagrams identify all input and output signals.
- f. Ensure that wiring diagrams identify the functions of all test points.
- g. Ensure that the unit or subunit designator is noted on the drawing and is consistent with related documents.
- h. Ensure that the drawing identifies grounds and shows their location.
- i. Wiring diagrams must refer to associated assembly and schematic drawings.
- j. Make sure that the drawings detail the use of wire numbers or color codes, and that their use is consistent with that of related drawings and associated lists.

5.4.3 Schematic, logic, and interconnection diagrams. Check the following:

- a. Ensure that diagrams are prepared for each subunit.
- b. Diagrams must identify inputs and outputs and show their tolerances.
- c. Ensure that parts are shielded where grounded.
- d. Ensure that diagrams show the directional alignment of all components, and that it is consistent with what is shown on associated documents. This is especially important for components which are affected by polarity, such as batteries, diodes, and rectifiers.
- e. Separately replaceable assemblies must be identified by an appropriate reference designator.
- f. Ensure that all components are identified by reference designator and type number.
- g. Ensure that schematic drawings show the capacity ratings of safety devices such as fuses and circuit breakers.
- h. Values, ratings, and tolerances must be shown for all components.

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- i. Ensure that schematic drawings identify the functions of test points.
- j. Logic symbols must be used per ANSI-Y14.15.
- k. Reference designators must be used per DOD-STD-100.
- l. Ensure that electronic symbols are used per DOD-STD-100.
- m. Ensure that schematic drawings refer to associated drawings.
- n. Ensure that terminals of relays, plugs, and other connections are identified.

5.4.4 Printed wiring board drawings. Check the following:

- a. Analyze and evaluate the printed wiring design for conformity to applicable specifications.
- b. Printed wiring fabrications must conform to applicable specifications.
- c. Ensure that drawings depict wiring boards in detail, and identify all components. Drawings must conform to Section 4 of MIL-STD-275.
- d. Drawings must be laid out on a grid system.
- e. Both sides of a wiring board, including reduction dimensions, must be shown on the same wiring board drawing. Ensure that front-to-back registration points are defined, precisely located, and adequately controlled.
- f. Ensure that marking information depicted on the wiring board drawing is consistent with what is shown on associated drawings.
- g. Ensure that the wiring board makes reference to the corresponding schematic and assembly drawing.
- h. The board and assembly number must be the same as the numbers shown on the corresponding assembly drawing.
- i. The drawing must specify and depict conformal coating, when required.

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- j. Reference designators shown on the board drawing must be consistent with those shown on the assembly drawing and associated lists.
- k. Ensure that plug keys and terminals are identified.
- l. Wiring board drawings should not contain subunit numbers.
- m. Ensure that wiring board drawing notes include the subunit prefix.
- n. Ensure that masking is not used as a guide for hole locations.
- o. Make sure that the dimensions and tolerances of all holes are shown. See DOD-STD-100.
- p. Ensure that the master pattern drawing is laid out per DOD-STD-100.
- q. Ensure that multilayer boards are depicted per DOD-STD-1495.
- r. When wiring board drawings are produced in digital form, ensure that their description and format are in accordance with ANSI/IPC-D-350.
- s. Separate views must be shown for double sided and multilayered boards.
- t. Ensure that wiring board drawings include adequate quality assurance (QA) provisions for the manufacture of the items they depict.
- u. Ensure that the circuitry pattern agrees with the schematic drawing.
- v. Ensure that fixed points on printed wiring boards are used as references to define the locations, width, and dimensions of conductors.
- w. Ensure that jumper wires are eliminated on production drawings.

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5.5 Reviewing control drawings.5.5.1 Specification control drawings (SCD).

5.5.1.1 Criteria for designation. To qualify as an SCD, the item depicted must meet the following criteria:

- a. It must be of an unmodified commercial type, available to both Government and industry on an unrestricted basis.
- b. The item must not have been developed for use in the equipment represented by the drawing package under review.
- c. The manufacturers' names, addresses, identification codes, and item identification numbers must be shown on the SCD.
- d. The drawing must list two or more known sources.

5.5.1.2 Reviewing SCD's. Analyze SCD's for the following information:

- a. They shall disclose, as applicable, item configuration, dimensions of envelope, mounting and mating dimensions, interface dimensional characteristics, and their limits.
- b. The SCD must show inspection and acceptance test requirements, performance, reliability, maintainability, environmental and other functional requirements, as necessary to ensure identification and adequate competitive procurement of an interchangeable item.
- c. If an electrical, electronic, or other engineering circuit is involved, a schematic, connection or other appropriate drawing shall be included or referred to by the drawing to provide sufficient information to mark external connections.
- d. SCD numbers are administrative control numbers and shall not be marked on the part. The SCD numbers are used to identify the item on other drawings or documents.
- e. Qualification testing of items in advance of procurement action is not a prerequisite for including an item on an SCD.

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- f. If a decision cannot be made from the information available, the manufacturer of the item or activity submitting the drawing should be contacted to verify that the item meets the criteria for a SCD.
- g. All sources of supply should be checked to verify that the part numbers listed on the drawing correspond to the item depicted on the drawing, and are currently available.
- h. The manufacturers' part number becomes the item's identification number.
- i. The notations "SPECIFICATION CONTROL DRAWING" and "IDENTIFICATION OF SUGGESTED SOURCES OF SUPPLY ..." must appear on the drawing per DOD-STD-100.
- j. SCD numbers are not marked on the parts.

5.5.2 Source control drawings (SOCD)

5.5.2.1 Criteria for designation. A SOCD defines an item which is procurable only from certain vendors for reasons such as the following:

- a. A vendor has a special technique which will make his product work in a system where others will not. The key elements may be identifiable.
- b. There is a specific, critical application, and substitute vendors shall not be used without prior testing, evaluation, and approval. Critical factors may include performance, installation, interchangeability or reliability, and must be spelled out on the drawing.
- c. The notation "SOURCE CONTROL DRAWING" must be on the drawing. See DOD-STD-100.

5.5.2.2 Reviewing SOCD's. SOCD requirements are identical to those for SCD's except for the following differences:

- a. Items must be tested and prequalified for inclusion in SOCD's.
- b. The drawing shall include the following note: "Only the item described on this drawing, when procured from the vendor(s) listed hereon, is approved by (name and

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address of cognizant design activity) for use in the application(s) specified hereon. A substitute item shall not be used without prior approval by (name of cognizant design activity) or by (name of Government procuring activity)."

- c. The drawing shall list under the heading "APPROVED SOURCES OF SUPPLY", the manufacturer's name, address, and identification code, and the part number of each item that has been tested and approved for use in the specific applications stated on the drawing.
- d. Whenever another vendor's item is tested and qualified for the stated applications or when a new critical application is found and all vendor items that are cited on the drawings are approved for use in the new critical application, the drawing may be revised to show the new vendor or application. Each new vendor added must be approved for all stated applications.
- e. SOCD's become the part identification numbers and are subsequently used to identify the item on other drawings or documents. When more than one vendor is listed on an SOCD for items that are repairable and the repair parts are not interchangeable between one vendor's item and another, each vendor's item shall be assigned a unique suffix of the SOCD number.
- f. Ensure that "SOCD" and the drawing number are marked on the part. The SOCD number becomes the item's part number. See DOD-STD-100.

5.5.3 Selected item drawings. Selected item drawing disclosure requirements are identical to those of SCD's except for the differences listed below:

- a. The drawing must contain the notation "SELECTED ITEM DRAWING."
- b. Complete details of the selection criteria shall be described, such as fit, tolerance, performance and reliability.
- c. When a vendor document is referred to in the selected item drawing, it shall be submitted with the drawing package. If the document is unobtainable, the selected item drawing shall contain sufficient information to identify that item before selection.

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- d. The part number, and the manufacturer's name, address and identification number shall be included in the drawing package.
- e. The original part number must be obliterated and the selected item drawing number shall become the part number of the selected item itself. See DOD-STD-100.

5.5.4 Altered item drawings. Altered item disclosure requirements are identical to those of SCD's and selected item drawings except for the differences listed below:

- a. The drawing shall include information necessary to identify the item prior to its alteration, including the original part number and the name and address of the original source. The name and address of the source need not be furnished if the original part is a Government or industry standard item.
- b. When a vendor activity document is referred to, the vendor data shall be submitted along with the altered item drawing. If the vendor or original design data is unobtainable, the altered item drawing shall contain sufficient information to identify that item prior to its alteration.
- c. The notation "ALTERED ITEM DRAWING" must appear on the drawing.
- d. The original part number must be obliterated.
- e. Altered item drawing numbers shall become the part numbers of the altered items. See DOD-STD-100.

5.6 Reviewing lists associated with the EDP.

5.6.1 Parts lists (PL's). See DOD-STD-100. Check the following:

- a. If separate PL's are used, make sure their format is correct.
- b. If separate PL's are used, ensure that PL numbers are correct.
- c. If an integral PL is used, ensure that the format is correct. Refer to ANSI-Y14.1.

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- d. Ensure that part or identifying numbers are correct (including items controlled by military specifications).
- e. "Find numbers" or "reference designators" used on the PL must be consistent with those shown on associated drawings.
- f. PL's may be revised only in accordance with DOD-STD-100.
- g. PL's must specify quantities wherever possible.
- h. Bulk items must be identified by a discrete identifier instead of quantity.
- i. Ensure that "as required" (AR) quantities are used only where appropriate.
- j. Items that are not adequately defined by a Government or industry specification must be depicted in a control or other type drawing.
- k. Ensure that parts depicted on specification control, source control, altered item, and selected item drawings are properly identified per DOD-STD-100.
- l. When PL's are produced on an automatic data processing system (ADPS), ensure that they are in the format specified by DOD-STD-100.
- m. Ensure that every item on a drawing is also on a PL.
- n. Verify that military and industry standard part numbers correctly identify the parts being used.

5.6.2 Data lists (DL's). See DOD-STD-100. Check the following:

- a. Ensure that the format is correct.
- b. Ensure that the DL contains all drawings, documents, and associated lists.
- c. Ensure that DL numbers are correct.
- d. Ensure that the DL is revised per DOD-STD-100.
- e. Ensure that documents are sequenced per DOD-STD-100.

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- f. Ensure that DL's are prepared for each major assembly, subassembly, or unit as required.
- g. Ensure that DL nomenclature is consistent with that used on the assembly drawing.

5.6.3 Index lists (IL's). See DOD-STD-100. Check the following:

- a. Ensure that the format is correct.
- b. Ensure that IL numbering is correct per DOD-STD-100.
- c. Ensure that documents are sequenced per DOD-STD-100.
- d. IL's must be prepared for each major assembly or system as required by the contractual instrument in effect.
- e. Ensure that each IL contains all applicable DL's and IL's.
- f. Ensure that the nomenclatures on IL's agree with those on the assembly drawing.

5.7 Preparing an ES.

5.7.1 Documenting discrepant findings. Whenever an in-process or final review of an EDP is completed, the Government reviewing agency shall document all discrepant findings for presentation to the contractor. The ES provides a method for documenting and compiling drawing discrepancies in a logical format. The ES format which follows may be used as a standard by DOD activities and should be briefed to the contractor during the contractor indoctrination (see 4.5).

5.7.2 Cover sheet. The first page of the ES contains the following information (see figure 1):

- a. System nomenclature, contract number, contractor, ES volume number, and date prepared are centered in the cover sheet.
- b. The name of the Government reviewing activity, address, and telephone number are located in the lower left corner of the sheet.

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5.7.3 Introduction. The ES introduction contains the following information (see figure 2):

- a. Authority for performing the review.
- b. System nomenclature.
- c. Contractor.
- d. Contract number.
- e. CDRL drawing requirements.
- f. Purpose of the technical review.
- g. Statements indicating that comments concerning discrepant findings may also apply to documents that were not inspected during the review and that the contractor is responsible to inspect the entire EDP and correct similar deficiencies.
- h. The scheme by which discrepancies are presented in the ES (TDBD order, numerical sequence, etc.).
- i. Action to be taken by the contractor.

5.7.4 List of general comments. Comments of a repetitive nature, which pertain to five or more drawings, should be written only once as general comments. The general comments list will precede the general comments section and identify all the general comments generated during the review. The title "List of General Comments" is placed at the top of the sheet, and columns entitled "General Comment Letter" and "Title" will follow. Each general comment shall be assigned a letter in sequence (see figure 3).

5.7.5 General comments. This section fully describes each discrepancy, citing references and examples. If annotated drawings are to be returned to the contractor, the discrepant portion of each drawing or associated document shall be annotated by the letter of the appropriate general comment squared in red. General comment sheets shall contain the following information (see figure 4):

- a. The title "General Comment X" (X representing the appropriate letter) shall be centered at the top of the page, along with the title of the comment.

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- b. A brief narrative will follow, describing the discrepancy and citing the specification, standard, or DID which has been violated.
- c. The phrase, "examples of this condition can be found on the following drawings" shall follow the narrative, along with a list of drawing numbers to which the comment applies.

5.7.6 A list of reviewed drawings to which only general comments apply. This page shall consist of the following (see figure 5):

- a. The title "List of Reviewed Drawings to Which Only General Comments Apply" is centered at the top of the page, followed by columns titled "Drawing Number," "Drawing Title," "Revision," and "General Comment Letter(s)."
- b. Drawings should be listed in alpha-numeric order.

5.7.7 Index of reviewed drawings to which specific comments apply. This page cross-references each drawing against which a specific comment applies to the page in the ES on which the comment can be found. This index is only needed when specific comment sheets are in TDBD sequence (see 4.8.2.). It shall contain the following (see figure 6):

- a. The title "Index of Reviewed Drawings to Which Specific Comments Apply" at the top of the page, with columns titled "Drawing Number," and "Page" underneath.
- b. Drawings should be listed in alpha-numeric sequence.

5.7.8 Specific comment sheets. Prepare a specific comment sheet for each reviewed drawing on which discrepancies were noted. The sheets can be arranged in alpha-numeric sequence or TDBD order (see 4.8.2). Each sheet shall consist of the following (see figure 7):

- a. The drawing title in the upper left corner of the page.
- b. The drawing number and revision letter in the upper right corner of the page.
- c. The specific comments are listed consecutively on the left margin by number. If annotated drawings will be

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returned to the contractor, each specific comment must correspond to an annotated area on the drawing, indicated by the number squared in red.

- d. Each specific comment will briefly describe the discrepancy and cite the specification, standard, or DID which has been violated, and if annotated drawings are not going to be returned to the contractor, indicate where on the drawing the discrepancy exists.
- e. After the specific comments are listed, all general comments which apply to the drawing are cited by letter.

5.7.9 List of missing documents. This list cites all documents that are required as part of the EDP but which were not furnished by the contractor. The list is generated as a result of the TDBD (see 4.9.1). The page shall consist of the following (see figure 8):

- a. The title "List of Missing Drawings" is centered at the top of the page, with columns titled "Document Number," "FSCM," "Title," "Referenced on," and "Location" listed below. The "Referenced on" column indicates what document cites the missing document, and the "Location" column indicates where the missing document was cited (parts list, note, or material block).
- b. Missing drawings should be listed in alpha-numeric sequence.

5.7.10 IL/DL discrepancies. An IL/DL discrepancy form shall be prepared for each IL or DL on which discrepancies were noted. The list number, revision letter and nomenclature shall be at the top of the page, with columns titled "Item," "Application," and "Action Required" placed below (see figure 9).

5.7.11 Distribution of the ES. The ES should be sent to the program office responsible for the procurement of the system under review. The program office shall forward the ES to the contractor via the contracting officer. The reviewing activity should retain a copy of the ES and a copy of the annotated drawings until the final delivery of the EDP is accepted by the Government. If annotated drawings are being returned to the

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contractor, they should be sent with a cover letter cautioning the contractor not to begin correcting the EDP until directed by the Government contracting officer.

Preparing activity:
NAVY - MC
Project No. DRPR-N275

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ENGINEERING STUDY

(EQUIPMENT NOMENCLATURE)

CONTRACT XXXXXX-XX-X-XXXX

(CONTRACTOR)

ENGINEERING STUDY VOLUME XX

(DATE PREPARED)

PREPARED BY:

(Government Review Activity Name)

(Address)

(Address)

TELEPHONE (XXX) XXX-XXXX

Figure 1. Sample Format of an Engineering
Study Cover Sheet

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INTRODUCTION

(Government Procuring Activity or Program Office) has assigned the (review activity) the responsibility to review the Engineering Drawings and Associated Lists submitted for the (equipment nomenclature). These drawings and lists were submitted by (contractor) under Contract XXXXXX-XX-X-XXXX as a level X package in accordance with requirements of DOD-D-1000.

The review was conducted to evaluate the technical content of the engineering drawings and their compliance with the contract requirements. The comments in this engineering study are intended to point out deficiencies found in the engineering drawings. This review is not intended to be all-inclusive, but rather to point out examples of typical errors or omissions which require corrections. There may be additional discrepancies to those listed herein and the listed discrepancies might be found throughout the drawing package. The contractor is requested to make corrections throughout the entire package before resubmitting the drawings. The contractor is only required to resubmit new or corrected drawings for review.

This study is presented in the format of General Comments and Specific Comments. General Comments are repetitive in nature and are applicable to many drawings. Letters are used to designate repetitive comments and a list of General Comments is presented at the beginning of the study. Specific comments apply only to individual drawings, are designated by numbers, and are presented on a separate page for each drawing reviewed. An index is provided which cross-references discrepant drawings with specific comment sheets. Marked drawings were returned under separate cover, with the number or the letter of the applicable comment squared in red. (This last sentence is only included if annotated drawings are being returned to the contractor).

Figure 2 . Sample Format of an Introduction to an Engineering Study

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LIST OF GENERAL COMMENTS

<u>GENERAL COMMENT LETTER</u>	<u>TITLE</u>
A	Specification Error MIL-P-23377
B	Specification Error MIL-F-14072
C	Specification Error TT-E-485
D	Specification Error QQ-A-200
E	Removal of Proprietary Statements

Figure 3. Sample Format of a List of General Comments

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GENERAL COMMENT A

SPECIFICATION ERROR MIL-P-23377

Prime Finish is specified as MIL-P-23377, Class 2 on the drawing, but no Class 2 is listed in MIL-P-23377. MIL-P-23377 requires that Type and Component be specified for epoxy-polyamide primer coatings. Please rectify.

The following documents are examples of this problem:

<u>Drawing</u>	<u>Rev</u>
130533	A
130534	C
130535	F
130536	-
130537	B

Figure 4. Sample Format of a General Comment, Engineering Study

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LIST OF REVIEWED DRAWINGS TO WHICH ONLY
GENERAL COMMENTS APPLY

<u>DRAWING NUMBER</u>	<u>DRAWING TITLE</u>	<u>REVISION</u>	<u>GENERAL COMMENT LETTER(S)</u>
130566	Adapter	B	A, B & C
130570	Conductor Assy	-	A & B
130595	Clamp, Bolt	-	A & B
130634	Outer Cover	F	A, B & C
130697	Mount	G	A, B & D
130710	Back Panel	A	A & B
139418	Pivot	C	A & B

Figure 5. Sample Format of a List of Reviewed Drawings
to Which Only General Comments Apply

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INDEX OF REVIEWED DRAWINGS TO WHICH
SPECIFIC COMMENTS APPLY

<u>Drawing No.</u>	<u>Page</u>
825029A0000	5
825029A2000	6
825029A3003	7
825029A4000	8
825029A5000	9

Figure 6. Sample Format of an Index of Reviewed Drawings
to Which Specific Comments Apply

MIL-HDBK-288 (MC)

PRINTED WIRING ASSEMBLY

IP 130490
Rev - A

1. Sheet 1, zone B-5, indicates that five holes are to be installed. Shouldn't this be seven holes?
2. Sheet 1, zone A-7: Find Number not indicated.
3. Page 40, paragraph 5, line 5 of Drawing EL 130558 indicates "K13 X1 to J5c" which does not agree with this drawing. Please rectify.

NOTE: General Comment A also applies to this drawing.

Figure 7. Sample Format of a Specific Comment Sheet

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LIST OF MISSING DRAWINGS

<u>Document No.</u>	<u>FSCM</u>	<u>Dwg Title</u>	<u>Referenced On</u>	<u>Location</u>
149632	80372	Bolt	126100	Note 4
165300	95011	Unknown	126100	Item 49
166320	67802	Test Procedure	142200	Item 5
179990	33575	Casting	145422	Note 9
190456	48111	Unknown	146334	Note 12

Figure 8. Sample Format of a List of Missing Drawings

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INDEX/DATA LIST DISCREPANCY FORM

List No. _____ Revision _____
Nomenclature _____

Item	Application	Action Required
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Figure 9. Sample Format of an Index List/Data List
Discrepancy Form

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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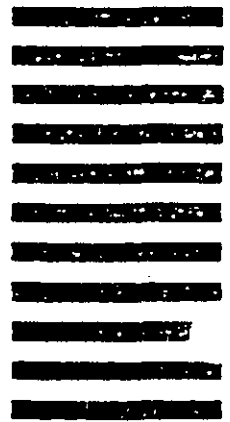
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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-HDBK-288(MC)		2. DOCUMENT TITLE REVIEW AND ACCEPTANCE OF ENGINEERING DRAWING PACKAGES	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
b. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)