

## David Taylor Research Center

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Computation, Mathematics, and Logistics Department  
Test and Evaluation Report

### Proposed Draft Military Handbook for Preparation of View Packages in Support of Electronic Technical Manuals (IETMs)

by  
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DTRC-90/026 Proposed Draft Military Handbook for Preparation of View Packages in Support  
of Electronic Technical Manuals (IETMs)



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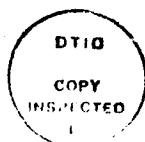
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both those content, style, format, and User-Interaction Requirements common to all View Packages and those unique to individual VPs; (c) summarizes the process of creating a VP, both under the authoring system, and by computer-assisted (algorithmic) approaches; and (d) provides an outline for a View Package Specification.

A copy of MIL-M-IETMVP is included in this report as an Appendix.

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#### APPENDIX A

Copy of Draft Military Handbook:

**MIL-HDBK-IETMVP. *Guidelines for Developing  
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Technical Manual (IETM) View Packages.***

1 June 1990. . . . . 35

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## ABSTRACT

This Report summarizes recent activities in the Department of Defense and in the US Navy, Army, and Air Force to establish Service use of Interactive Electronic Technical Manuals (IETMs) as replacements for paper Technical Manuals for logistic support of military equipment.

The IETM concept is described, and an overview is provided of five IETM acquisition Specifications and Military Handbooks developed by the Tri-Service Interactive Electronic Technical Manual Working Group established in 1989 by the Defense Quality and Standardization Office.

One of these five draft documents, MIL-HDBK-IETMVP, *Guidelines for Developing Specifications for Interactive Electronic Technical Manuals (IETM) View Packages*, 1 Jun 1990, is described and presented. (Four other companion Reports have been prepared to introduce and describe the four related IETM acquisition Specifications and Handbooks.)

This Report summarizes the purpose and the structure of the View Package Handbook, which is written to provide guidance to a System Acquisition Manager for the preparation of IETM View Package acquisition Specifications. The Report:

- (a) Defines the concept of a View Package (an increment of Technical Information designed to be viewed interactively by means of an Electronic Delivery System) and relates the View Package production process to the other components of the IETM concept;
- (b) Describes the procedure for establishing View Package Requirements, both those Content, Style, Format, and User-Interaction Requirements common to all View Packages and those unique to individual View Packages;
- (c) Summarizes the process of creating a View Package, both under the direct control of an Author using an automated authoring system, and by computer-assisted (algorithmic) approaches;
- (d) Provides an outline for a View Package Specification.

A copy of MIL-HDBK-IETMVP is included in this Report as an Appendix.

## ADMINISTRATIVE INFORMATION

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

During the 1980s, it became increasingly apparent that the striking increases in the complexity and sophistication of the weapon systems of all three Services were causing a serious lag in the production, distribution, and management of the Technical Information required to maintain, operate, and support these systems. Of particular concern were increasing weight and space requirements resulting from the increasing bulk of the required paper Technical Manuals.

At the same time, a number of significant technological improvements were being made in the field of information handling, particularly the advent of small, inexpensive, fast computers. Such innovations offered the potential of almost complete replacement of paper-based Technical Information through the use of light, easily stored, highly capable electronically processible media, which at the same time were capable of more effective interactive display to the end user.

Research, Development, Test, and Evaluation efforts of the three Services during this past decade have conclusively demonstrated, both through field tests and through in-house analyses and experimentation, the feasibility and intrinsic value of providing integrated Technical Information in paperless form in such a way that it can be displayed to end users by means of an interactive Electronic Display System.

For example, the Navy Technical Information Presentation System (NTIPS) Program at David Taylor Research Center, the Navy's Lead Laboratory for TI automation, demonstrated under operational conditions the improvements achievable in maintenance-technician performance [Refs (1) and (2)] through the use of electronically displayed TI. Similar results have been achieved by the Air Force under its Computer-based Maintenance Aiding Information System (CMAS) and its Integrated Maintenance Information System (IMIS) programs [Refs (3) and (4)]. The Army has automated Training Information under its Electronic Information Delivery System (EIDS), and has assessed the capability of using field portable maintenance aids under the Militarized Electronic Information Delivery System (MEIDS) program.

In addition, a number of pilot prototype developments and tests involving land, sea, and air vehicles and their weapon systems are being carried out, by individual System Acquisition Managers of all three Services, in an effort to provide interactive and electronically displayed Technical Information.

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- Ref (1) Fuller, Joseph J., Theodore J. Post, and Anne S. Mavor, "Test and Evaluation of the Navy Technical Information Presentation System (NTIPS), F-14A Field Test Results," DTRC-88/036 (Sep 1988).
- Ref (2) Fuller, Joseph J., Raymond L. LeBeau, Anne S. Mavor, Theodore J. Post, and Charles S. Sawyer, "Test and Evaluation of The Navy Technical Information Presentation System (NTIPS), AN/SPA-25D Test Results," DTRC-88/035 (Sep 1988).
- Ref (3) Thomas, D.L. and J.D. Clay, "Computer-Based Maintenance Aids for Technicians: Project Final Report," Air Force Human Resources Laboratory, AFHRL-TR-87-44 (Aug 1988).
- Ref (4) Link, W.R., J.C. Von Holle, and D. Mason, "Integrated Maintenance Information System (IMIS): A Maintenance Information Delivery Concept," Air Force Human Resources Laboratory, AFHRL-TP-87-27 (Nov 1987).

## 1.2 DOD AND TRI-SERVICE PROGRAMS ESTABLISHED IN RESPONSE TO TECHNICAL INFORMATION AUTOMATION POLICY

To coordinate and standardize the increased use of computer-aided logistic support throughout the three Services, the Department of Defense established the Computer-aided Acquisition and Logistics Support (CALS) program [see Ref (5)], which also has had a wide effect in stimulating progress toward the goal of TI automation, and particularly toward standardization of such efforts.

The Department of Defense established [Ref (5)], and later reiterated [Ref (6)], a policy requiring that access to and the delivery of system-related logistic-support information be automated.

For example, Ref (6) provided the following directions:

- a. For systems now in full-scale development or production, program managers were required to review specific opportunities for cost savings or quality improvements that could result from changing delivery or access using the Computer-aided Acquisition and Logistics Support standards.
- b. For systems entering development after September 1988, acquisition plans, solicitations, and related documents

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Ref (5) DEPSECDEF MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS, of 24 Sep 1985. Subj: Computer Aided Logistic Support.

Ref (6) DEPSECDEF MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS AND DIRECTOR, DEFENSE LOGISTICS AGENCY, of 5 Aug 1988. Subj: Computer-Aided Acquisition and Logistic Support.

required specific schedule and cost proposals for:

- (1) integration of Contractor Technical Information systems and processes;
- (2) authorized Government access to Contractor data bases; and
- (3) delivery of Technical Information in digital form.

c. DOD components were to program for automated systems to receive, store, distribute, and use digital weapon-system Technical Information, including achieving the earliest possible date for digital input to DOD engineering data repositories.

More recently, the Joint Uniform Service Technical Information System (JUSTIS) concept has been announced, a planned effort which will combine, to as great a degree as possible, Tri-Service procedures and equipment for acquisition and control of system-support Technical Information.

### 1.3 THE INTERACTIVE ELECTRONIC TECHNICAL MANUAL CONCEPT

The culmination of this effort throughout the 1980s in response to the DOD policy statements cited has been the development of the Interactive Electronic Technical Manual (IETM) Concept. The IETM Concept involves full application of existing technological capabilities to the problems of providing Technical Information which is both more effective for the end user and more efficient in terms of acquisition, control, and update.

The IETM Concept involves a system approach, which includes basically all of the following components:

- a. A standardized, automated, revisable source Data Base.
- b. Use of a computer-controlled authoring system.
- c. The generation of digital Technical Information (containing text and graphics), either directly by an Author, or automatically by computer. This Technical Information is recorded on an electronically processible medium (optical or magnetic), rather than on paper.
- d. Technical Information (consisting of task-related increments) which is optimally arranged and formatted for interactive screen presentation.
- e. Presentation (display to the end user) by means of a computer-controlled Electronic Display System (EDS) possessing an extensive user-interaction capability. The EDS is capable of displaying the IETM, performing related logistic-support functions, and interfacing with other Service logistic-support Information Systems.

An IETM permits a user to locate required information more easily, and to present it faster, more comprehensibly, more specifically matched to the configuration, and in a form that requires much less storage than paper. Powerful troubleshooting procedures not possible with paper Technical Manuals are possible using the computational capability of the IETM Display Device.

IETMs will be used by maintenance technicians, afloat and ashore; to maintain and operate weapon systems by Intermediate and Depot maintenance Activities; and by training personnel.

The IETM Concept has been described in detail in Ref (7).

#### 1.4 PREPARATION OF SPECIFICATIONS AND HANDBOOKS FOR SERVICE-WIDE COORDINATION OF ACQUISITION OF AUTOMATED TECHNICAL INFORMATION

To coordinate this wide-spread effort, the Defense Quality and Standardization Office established in 1989, under the DOD Technical Manual Technology Exchange Subcommittee, chartered by DOD INST 4151.9 [Ref (8)], an Interactive Electronic Technical Manual Working Group, chaired by the Navy, whose primary functions were to:

- a. Foster the exchange of ideas and the agreement on a single approach regarding:
  - (1) the acquisition of IETMs which use computer technology for innovative electronic display; and
  - (2) presentation of Technical Manual Information among all Department of Defense Agencies.

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Ref (7) Rainey, Samuel C., Joseph J. Fuller, and Eric L. Jorgensen, "The Electronic Delivery of Automated Technical Information for Logistics Support of Navy Weapons Systems: Potential, System Description, and Status," DTRC-89/007 (Feb 1989).

Ref (8) DOD Instruction 4151.9 of 3 Jan 1989, "DoD Technical Manual Program Management."



b. Develop a set of DOD Specifications for:

- (1) The acquisition of IETM data; and
- (2) The Electronic Display Systems needed for the presentation of IETMs for the maintenance of DOD weapons, systems, and equipment.

The Working Group was also charged with the responsibility of providing a recommendation to the DOD CALS Policy Office concerning inclusion of IETM interchange Specifications into the set of CALS standards; e.g., in connection with MIL-STD-1840.

The Tri-Service Working Group consists of representatives of (a) the David Taylor Research Center (DTRC) of the Navy, (b) the Air Force Logistics Command (AFLC-MMDE), and (c) the US Army Communications-Electronics Command (AMCPM-TMDE).

With DTRC and the Air Force Human Resources Laboratory (as an advisor to AFLC) contributing the primary effort, a series of five Specifications (see Section 2.3) and Handbooks for IETM acquisition has been drafted. This series consists of:

- A Specification governing the nature of the Revisable IETM Data Base;
- A Specification providing general Content, Style, Format, and User-Interaction requirements for all IETMs;
- A Handbook describing for a System Acquisition Manager the best approach to writing acquisition specifications

for individual View Packages (to be used for IETM procurement);

- A Handbook presenting requirements for the Electronic Display System;
- A specification presenting requirements for an IETM Quality Assurance Program.

These documents have been widely circulated for comment within both the DOD and Industry.

These drafts were also developed to accomplish as a near-term objective the provision of a suite of IETM prototype acquisition documents for use by major DOD programs in establishing initial IETM capabilities. These programs include the Navy's A-12 Attack Aircraft Program, the Advanced Tactical Fighter Program of the Air Force, and the M-1 Main Battle Tank Program of the Army.

#### 1.5 PURPOSE OF PRESENT REPORT

The purpose of the present Report is to present and to describe in detail one of these draft documents, specifically: Copy of Draft Military Handbook: MIL-HDBK-IETMVP.

*Guidelines for Developing Specifications for Interactive Electronic Technical Manual (IETM) View Packages.*

1 June 1990.

A series of four other Reports has been prepared, each Report describing one member of the set of five acquisition documents prepared by this Working Group [Ref (9) through Ref (12)].

Section 2 of this Report provides an overall description of this suite of Acquisition Specifications and Handbooks. Section 3 summarizes the Approach and Requirements of one of the five documents; in this case, MIL-HDBK-IETMVP. The draft version of MIL-HDBK-IETMVP is included in this Report as Appendix A.

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|----------|--|
| Ref (9)  | Rainey, Samuel C., Eric L. Jorgensen, and Joseph J. Fuller, "Proposed Draft Military Specification for Revisable Data Base for Support of Interactive Electronic Technical Manuals (IETMs)," DTRC Report 90/027 (Jul 1990).                                    |
| Ref (10) | Rainey, Samuel C., Eric L. Jorgensen, and Joseph J. Fuller, "Proposed Draft Military Specification for Quality Assurance (QA) Program Requirements for Interactive Electronic Technical Manuals (IETMs)," DTRC Report 90/024 (Jul 1990).                       |
| Ref (11) | Jorgensen, Eric L., Samuel C. Rainey, and Joseph J. Fuller, "Proposed Draft Military Handbook Presenting Requirements for an Electronic Display System for Interactive Electronic Technical Manuals (IETMs)," DTRC Report 90/025 (Jul 1990).                   |
| Ref (12) | Jorgensen, Eric L., Samuel C. Rainey, and Joseph J. Fuller, "Proposed Draft Military Specification for General Content, Style, Format, and User-Interaction Requirements for Interactive Electronic Technical Manuals (IETMs)," DTRC Report 90/028 (Jul 1990). |

2.0 ACQUISITION DOCUMENTATION FOR  
INTERACTIVE ELECTRONIC TECHNICAL MANUALS  
AND ASSOCIATED TECHNICAL INFORMATION

2.1 DEFINITIONS

2.1.1 The Interactive Electronic Technical Manual (IETM).

As defined by the Working Group, an *IETM* is a Technical Manual, prepared (authored) by a Contractor and delivered to the Government, or prepared by a Government Activity, in digital form on a suitable medium, by means of an automated authoring system; designed for electronic-screen display to an end user; and possessing the following three characteristics:

- a. The format and style of the presented information are optimized for screen presentation to assure maximum comprehension; that is, the presentation format is "frame-oriented", not "page-oriented".
- b. The elements of Technical Information constituting the TM are so interrelated that a user's access to the information he requires is facilitated to the greatest extent possible, and is achievable by a variety of paths.
- c. The computer-controlled TM-Display Device can function interactively (as a result of user requests and information input) in providing procedural guidance, navigational directions, and supplemental information; and also in providing assistance in carrying out logistic-support functions supplemental to maintenance.

This terminology is consistent with the standard DOD definition of *Technical Manual*. Ref (8), states:

Technical Manuals are publications that contain instructions for the installation, operation, maintenance, training, and support of weapon systems, weapon-system components, and support equipment. TM information may be presented in any form or characteristic, including but not limited to hard printed copy, audio and visual displays, magnetic tape, discs, and other electronic devices. They normally include operational and maintenance instructions, parts lists or parts breakdowns, and related technical information or procedures exclusive of administrative procedures. Technical Orders (TOs) that meet the criteria of this definition may also be classified as TMs.

#### 2.1.2 The View Package.

IETM information, as provided to the end user for viewing on an Electronic Display Device, will be constructed in individual task-oriented increments called View Packages.

A *View Package (VP)* is a fully organized and formatted item of computer-processible Technical Information derived from an IETM Data Base and capable of interactive electronic display to an end user by means of an Electronic Display System (EDS). In function and design, a View Package is completely equivalent to an individual Interactive Electronic Technical Manual. A View Package may be constructed:

- a. entirely by an Author using an automated authoring system;

- b. completely automatically using a series of automated processes (software) which perform the data-selection, structuring, and formatting processes; or

- c. by a combination of the above two approaches.

A View Package is designed to support a specific function in the operation or logistics-support of a weapon system or other military equipment.

#### 2.1.3 Nature and Purpose of the Revisable IETM Data Base

As noted above, a View Package is created entirely from data contained in a *Revisable IETM Data Base* (IETMDB), which is a complete collection of Data Elements relating to a weapon system or other equipment acquired by the Government and constructed in a standardized procedure in order to provide the following capabilities:

- a. Government Activities or DOD Contractors concerned with logistic support for the weapon system involved can access the Data Base directly to obtain needed logistic-support information for specific purposes.
- b. The IETMDB can serve as the basis for construction and update of the entire suite of electronically displayed interactive weapon-system Technical Manuals through the use of automated authoring systems.
- c. The IETMDB can serve as the basis for fully automated construction, by either a Contractor or a

Government Activity, of View Packages, which are increments of interactive electronically presented logistic-support Technical Information.

- d. Required portions of the IETMDB can be interchanged by means of standardized procedures throughout the DOD and its supporting Contractors on a real-time basis when needed.

#### 2.1.4 The Electronic Display System (EDS)

The EDS is a computer-based Technical Information system designed to accept, process and integrate Technical Information for prime-equipment logistics support, and display that information to users. The EDS is also intended to support inquiries by users (in addition to Operations and Maintenance users) who have such responsibilities as supply, training, field-data collection, readiness measurement, operations scheduling, maintenance planning, maintenance quality control, and hardware configuration control. The software supporting the EDS will also be required to support additional (as yet unspecified) functions in the future, which will emerge as technologies and standards evolve. Specifically, the EDS is intended for use:

- a. In maintenance Work Centers and shops to support Troubleshooting and Planned and Corrective Maintenance;
- b. In portable form at remotely located maintenance sites;

- c. Embedded in a weapon-system control panel as support both for System operation and System maintenance;
- d. In presenting operating and maintenance information during personnel training courses;
- e. In a variety of centers and offices in support of System-related, logistics-supported functions which require Technical Information.

The Electronic Display System will consist of one or more computer-controlled Devices which display the required Technical Information by means of a screen (such as a cathode-ray-tube or a plasma display) either in a pre-ordered sequence or in random-access increments, as called for by the user; e.g., a maintenance technician. To accomplish this display, the IETM, consisting of the Technical Information recorded on a suitable medium (e.g., on an optical disc), is designed to be loaded into the EDS, "read" by this Device, and displayed in a sequence as directed by the user.

The IETMs to be used by this Display System must accordingly be so constructed as to assure full compatibility with the operating software of the Display Device, and must be tested by the preparing Contractor on such a Display Device prior to delivery.

#### 2.1.5 Summary

As noted, all IETMs:



- a. Will be constructed through the use of an automated authoring system, and will consist of task-related increments referred to as View Packages;
- b. Will be based on an automated system Data Base, the IETMDB, prepared by the System Prime Contractor for delivery as such to the Government, retention for his own use, or both;
- c. Will consist of a digital data stream recorded on an optical or magnetic medium, but not paper, electronically displayed by the Electronic Display System in terms of text and graphics;
- d. Will be optimally formatted and styled for screen presentation (i.e., "frame oriented" rather than "paper oriented").
- e. Will be constructed for electronic display on a highly interactive Electronic Display System, which will support related logistic-support functions and which may be networked for interface with other Service Information Management Systems.

## 2.2 IETM PROCUREMENT OPTIONS

Logistic-support procedures for weapon systems and related equipment differ to some extent among the Services. A certain amount of necessary variation in the acquisition procedures involving the VPs, the IETMDB, and the EDS has been provided in the system of Specifications and Acquisition Handbooks developed by the IETM Working Group.

Thus, these Specifications and Handbooks detail several optional approaches in the acquisition of IETMs. These are as follows:

a. Using appropriate IETM Specifications, the Service may buy whatever directly-authored Interactive Electronic Technical Manuals are required. Although the Author (equipment Prime Contractor) will need to establish an automated equipment or weapon-system (source) Data Base, this Data Base will not be acquired by the Government, but will be maintained and used by the Contractor, both for the preparation of IETMs and for other purposes.

(1) As an option, the Government might contract for on-line access to technical portions of this Contractor-owned Data Base. In such a case, both content and accessibility aspects of the IETM Data Base would have to be constructed to standard requirements.

b. Acquisition by the Government of directly authored IETMs (fully prepared and validated by the Contractor) as well as the IETM Data Base upon which they are based. Government acquisition of the IETM Data Base may involve either of the following options:

(1) Delivery to the Government in standardized form and subsequent maintenance by the Government (with or without update information supplied on a continuing basis by the Contractor);

(2) Title acquired to the IETM Data Base by the Government, but with the Data Base retained and

maintained in the Contractor's plant. The Government to be provided with on-line access to the Data Base.

c. Based on acquisition of the IETM Data Base, using either option b.(1) or b.(2), preparation of View Packages using either a fully automated process or one which is essentially fully automated. View Packages could be prepared either:

(1) By the Contractor [based on Data-Base acquisition option b.(1)], and delivered as such to the Government, or

(2) By the Government [based on Data-Base acquisition option b.(2)].

## 2.3 SUMMARY AND PURPOSE OF THE DRAFT ACQUISITION SPECIFICATIONS AND HANDBOOKS PREPARED BY THE TRI-SERVICE IETM WORKING GROUP

As noted, five draft Specifications and Handbooks have been prepared, and circulated widely for DOD and Industry comment, to provide System Acquisition Managers with the necessary contractual documentation for acquisition of Interactive Electronic Technical Manuals, the associated Data Base, and the necessary Electronic Display Systems. These statements of requirements are preliminary and will certainly be modified as experience is gained with the acquisition, management, and use of this type of Technical Information, as the technology advances, and as the Department of Defense

improves its in-house logistic-support infrastructure for support of IETMs.

The five draft Specifications and Handbooks prepared by the Inter-Service IETM Working Group (of which Appendix A of this Report is one), together with individual statements of the purpose of each document, are as follows:

#### 2.3.1 The Revisable IETM Data Base Specification

##### 2.3.1.1 Title

Draft MIL-D-IETMDB. *Revisable Data Base for Support of Interactive Electronic Technical Manuals (IETMs).*  
1 June 1990.

##### 2.3.1.2 Purpose

This Specification contains the requirements for a Revisable Interactive Electronic Technical Manual Data Base (IETMDB) to be constructed by a weapon-system Contractor. This non-redundant and neutrally formatted Data Base is intended to be the single source of data for all Technical Manuals to be used in support of a given weapon system, or other equipment being acquired by the Government. This Specification may be used in two primary modes:

- a. as a set of standard requirements to which the Contractor must adhere in the development and

maintenance of his internal Data Base for subsequent conversion to Government-deliverable form; and

- b. as a set of requirements for a Data Base that is physically delivered to the Government, or is maintained by the Contractor on behalf of the Government.

### 2.3.2 The IETM General Content, Style, Format, and User-Interaction Requirements Specification

#### 2.3.2.1 Title

Draft MIL-M-GCSFUI. *Manuals, Interactive Electronic Technical: General Content, Style, Format, and User-Interaction Requirements for.* 1 June 1990.

#### 2.3.2.2 Purpose

This Specification contains common requirements for the Content, Style, Format, and User-Interaction features required for Interactive Electronic Technical Manuals and the operating software of the devices upon which they are viewed. These IETMs are to be delivered to the Government in digital form and must be designed for interactive display to the maintenance-technician end-user by means of a computer-controlled Electronic Display System. The range of IETMs for which general requirements are described in this Specification will cover the maintenance, diagnostic, training, system-operation, parts-information, and installation functions which are required to achieve and maintain full operational capability of a specific weapon system or other military equipment.

### 2.3.3 The IETM View Package Handbook

#### 2.3.3.1 Title

**Draft MIL-HDBK-IETMVP. *Guidelines for Developing Specifications for Interactive Electronic Technical Manual (IETM) View Packages.* 1 June 1990.**

#### 2.3.3.2 Purpose

The purpose of this Handbook is to provide guidance for the preparation of individual View-Package Specifications, so that System Acquisition Managers may define View Package Requirements quickly and effectively for the numerous different specialized increments of Technical Information which will be required. A Handbook of this type has been referred to as a meta-specification: a Specification describing how to write a View Package specification which is the end-item specification for procurement of an actual IETM.

### 2.3.4 The IETM QA Program Requirements Specification

#### 2.3.4.1 Title

**Draft MIL-M-IETMQA. *Quality Assurance (QA) Program Requirements for Interactive Electronic Technical Manuals (IETMs) and Associated Technical Information.* 1 June 1990.**

#### 2.3.4.2 Purpose

This Specification prescribes the requirements for a Contractor's QA program for Interactive Electronic Technical Manuals (IETMs) and, where procured, the associated IETM Data Bases and supporting View Packages. The requirements herein cover the QA process and present the plan for implementing it, from planning through final submission of the delivered product for acceptance; they apply as well to changes and revisions thereto.

#### 2.3.5 The Electronic Display System Handbook

##### 2.3.5.1 Title

Draft MIL-HDBK-EDS (Navy). *Electronic Display System (EDS) for Interactive Electronic Technical Manuals (IETMs)*. 1 June 1990.

##### 2.3.5.2 Purpose

This Handbook describes the basic functional requirements for an Electronic Display System (EDS) designed to display Interactive Electronic Technical Manuals (IETMs). It establishes the minimum system requirements to be used in a detailed Specification for competitive procurement, either for portions of the full requirements or tailored to suit the application, user environment, device compatibility, and interfaces to existing computer systems.

The requirements described in this Handbook are of three types:

- a. Those which describe the Electronic Display System hardware;
- b. Those which describe the EDS software of the display System for system operation, IETM applications, and utility functions.
- c. Those which specify the minimum performance of the several individual Display Devices which constitute the EDS.

To achieve full compatibility of the EDS with the IETMs and View Packages, the Display System Software (as well as the View Package) must also be constructed in compliance with MIL-M-GCSFUI.

Each of the three Services has its own strategies for developing Specifications and Standards for an Electronic Display System. This Handbook presents the existing Navy concepts, and is accordingly identified as a Navy-only document. Proposed concepts of the other Services which do not differ extensively from requirements described in this Handbook will be included in succeeding versions of the Handbook.

#### 2.4 RELATIONSHIP OF MIL-HDBK-IETMVP TO OVERALL SET OF IETM-ACQUISITION SPECIFICATIONS AND HANDBOOKS

As described in Section 2.1.2 of this Report, a View Package is an increment of IETM Technical Information designed to support some specific weapon-system logistic support



function, and organized and formatted for interactive viewing by the end user through use of an Electronic Display Device. Complex systems may require many such View Packages for support of individual functions. Acquisition Specifications will be required so that the equipment Prime Contractor can provide, in the required form, the particular Technical Information that is to be extracted from the IETM Data Base described in MIL-M-IETMDB.

MIL-HDBK-IETMVP details the process of preparing such Specifications, including guidance for extracting general requirements from the Specification MIL-M-GCSFUI and for preparing the unique VP requirements. MIL-HDBK-IETMVP requires that the Quality Assurance procedures for the VP construction process be those provided in MIL-M-IETMQA, and that the VP be so constructed as to be entirely compatible with the Electronic Delivery System defined by MIL-HDBK-EDS.

**3.0 SUMMARY OF MIL-HDBK-IETMVP**  
**GUIDELINES FOR DEVELOPING SPECIFICATIONS FOR**  
**INTERACTIVE ELECTRONIC TECHNICAL MANUAL (IETM)**  
**VIEW PACKAGES (VPs)**

**3.1 PURPOSE OF MIL-HDBK-IETMVP**

As noted in Section 2.3.3 of this Report, MIL-HDBK-IETMVP has been written to provide guidance to a System Acquisition Manager that will enable him to prepare adequate procurement View Package Specifications (VPSs). Although it contains a list of requirements for incorporation into the VPS (and cites others), it is not of itself a Specification. The System Acquisition Manager must follow the procedures cited in the Handbook to compose VPSs for the numerous and varied types of VPs which will be required for support of the more complex weapon systems. The Handbook also presents a detailed VP Specification outline which the System Acquisition Manager should follow.

**3.2 VIEW-PACKAGE-ACQUISITION OPTIONS**

As summarized in Section 1.4 of the Handbook, View Packages, which are to be based on an IETM Data Base of the type described in MIL-M-IETMDB, may be generated:

- a. by a weapon-system (or other military-equipment) Prime Contractor; or
- b. by a Government Activity, which has acquired title (or access) to the Revisable IETM Data Base involved.

In either case, the VP may be created:

- a. entirely by an Author using an automated WYSIWYG (What-You-See-Is-What-You-Get) authoring system; or
- b. through the use of a computer-based algorithmic approach which extracts the required Technical Information from the IETMDB, structures it, and formats it for interactive delivery by means of an EDS.

Contractor VP-preparing Activities and Government VP-preparing Activities must use the same approaches in VP generation and must conform to the same requirements. The VP Specifications-preparation procedure described by this Handbook, however, is intended to enable construction of a VPS which is to be used by the Government as a contractual instrument when a System Acquisition Manager procures military equipment and associated VPs from a Contractor. VPSs so prepared will apply either to directly authored VPs or to those prepared by computerized construction methods.

### 3.3 PREPARATION OF THE VP SPECIFICATION

MIL-HDBK-IETMVP describes (Section 1.3) in some detail the 11-step process involved in creating a comprehensive Specification which will result in a VP that is both technically adequate for its intended purpose and constructed so that it can be displayed interactively with a compatible Electronic Display System. This process requires the following overall approaches:

- a. Definition of purpose and function of the VP;
- b. Establishment of the Technical Content required by the VP to fulfill the functions for which the VP is intended;
- c. Selection from MIL-M-GCSFUI of (1) general Content, Style, Format, and User-Interaction Requirements applicable to all VPs and (2) those which are related to specific types of information presentation (e.g., to procedures, troubleshooting);
- d. Establishment of unique Content, Style, Format, and User-Interaction Requirements for the View Package;
- e. When the option of automated formulation of a View Package is exercised by the System Acquisition Manager, establishment of (1) requirements for algorithmic extraction of the required Data Entities from the IETM Data Base, (2) requirements for algorithmic structuring (compilation) of these Data Entities into sequential presentations, and (3) requirements for algorithmic incorporation of required Style, Format and User-Interaction features into the View Package;
- f. Establishment of requirements for a comprehensive QA program (based on MIL-M-IETMQA);
- g. Establishment of requirements for preparation of the VP for delivery to the Government.

### 3.3.1 Establishment of Requirements for VP Technical Content

Requirements for the Technical Information (TI) which a View Package must present to the end user are the same whether the presentation medium is a hard copy Technical Manual or an Interactive Electronic Technical Manual. The difference lies in the superiority of the presentation mode for IETMs and in the far more efficient logistics chain leading from the TI Author to the end user.

Accordingly, as noted in the Handbook (Section 2.3), establishment of Technical Information requirements involves the same processes as those involved in developing paper-TM Technical Information requirements. All of the Services have standing Specifications which define this type of requirement for various types of military equipment and logistic-support functions. These are cited as source material in the Handbook.

## 3.4 VIEW PACKAGE COMPOSITION PROCESS

### 3.4.1 Required Tools

The Handbook details requirements a VPS must contain so that the Contractor's VP-composition process (direct authoring or algorithmic) will provide the required product. As an initial requirement, for example, the VPS must cite the basic tools that any Contractor (or Government Activity) must possess prior to beginning the composition of a View Package (see Section 1.5.1 of the Handbook). These include:

- a. A complete list of all Content, Style, Format, and User-Interaction Requirements, both general and unique, imposed by the Government;
- b. Access to the Data Element Dictionary (DED) as defined by MIL-D-IETMDB and which contains all of the required Technical Information data entities;
- c. For the option involving algorithmic preparation of the VP, a complete set of approved software which will carry out the required functions;
- d. For VP construction under direct control of an Author, a suitable automated authoring system;
- e. A QA organization and plan to assure preparation of a high-quality VP product;
- f. Access to a Government-approved or Government-furnished Electronic Delivery System to serve as the basis for quality review and testing of the VP.

#### 3.4.2 Steps in View Package Composition

After the necessary VP-composition tools have been assembled by the VP-preparing Activity, the process of preparing a View Package consists of:

- a. Extracting the required Data Entities from the IETMDB (Section 2.3.5 of the Handbook);

- b. Structuring (compiling) this information, and formatting it for viewing by means of an EDS (Section 2.4 of the Handbook);
- c. Performance of a QA program throughout (Section 2.12 of the Handbook);
- d. Putting the VP in standardized form for delivery to the Government (Section 2.13).

Requirements for cases in which steps a. and c., above, are fully automated (i.e., carried out by means of a suitable software package) are described in Sections 2.7 through 2.10 of the Handbook:

- a. Automation of the Data-Entity Extraction Process (Section 2.7);
- b. Automation of the View Package Compilation Process (Section 2.8);
- c. Automation of View Package Formatting (Section 2.9);
- d. Automation of Required View Package User-Interaction and Presentation Features (Section 2.10).

### 3.5 THE VIEW PACKAGE SHELL

The Handbook also outlines (Section 1.8) an acquisition option, referred to as the View Package Shell, consisting of a software program composed of several modules, having the capability to perform automatically the VP composition steps

listed under Section 3.4.2, above, but which has not yet been applied to a specific IETMDB for the extraction of particular Data Entities. Such a "Shell" may be applied by a System Acquisition Manager (for example) in constructing several (similar) VPs for various functions, depending on his requirements, by application to particular weapon-system IETM Data Bases.

### 3.6 VP SPECIFICATION OUTLINE

To provide as much standardization as possible in the specification and construction of View Packages, the Handbook (Section 3) provides a proposed outline and format recommended for use for all View Package Specifications prepared by the Services.



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## APPENDIX A

Copy of Draft Military Handbook:

**MIL-HDBK-IETMVP**

***Guidelines for Developing Specifications for  
Interactive Electronic Technical Manual (IETM)  
View Packages.***

1 June 1990

Prior to the publication of this report the document included as Appendix A has been officially submitted to the DOD Defense Quality Standardization Office and the DOD CALS Policy Office by the Office of the Chief of Naval Operations, Code 403 - Logistics Policy (OPNAV LTR 4160 Ser 403T/OU593187 dtd 4 Jun 1990). It has also been submitted to the Pageless Technical Manual Working Group of the Aerospace Industry Association for Review and Comment. This document was distributed as a review draft and is largely a DTRC product with assistance from the Air Force as noted. This Appendix is in the exact form that was submitted to these organizations.

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\*\*\*\*REVIEW DRAFT\*\*\*\*

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: David Taylor Research Center, Code 182.3, Bethesda, Maryland 20084-5000.

MILITARY HANDBOOK

GUIDELINES FOR DEVELOPING SPECIFICATIONS FOR  
INTERACTIVE ELECTRONIC TECHNICAL MANUAL (IETM)  
VIEW PACKAGES (VPs)

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## MILITARY HANDBOOK

**GUIDELINES FOR DEVELOPING SPECIFICATIONS FOR  
INTERACTIVE ELECTRONIC TECHNICAL MANUAL (IETM)  
VIEW PACKAGES (VPs)**

**1. INTRODUCTION****1.1 IETM View Package Definition**

A View Package is a fully organized and formatted item of computer-processible Technical Information derived from an IETM Data Base and capable of interactive electronic display to an end user by means of an Electronic Display System (EDS). In function and design, a View Package is completely equivalent to an individual Interactive Electronic Technical Manual. A View Package may be constructed (1) entirely by an Author using an automated authoring system; (2) completely automatically using a series of automated processes (software) which perform the data-selection, structuring, and formatting processes; or (3) by a combination of the two approaches. A View Package is designed to support a specific function in the operation or logistics-support of a weapon system or other military equipment.

Whether a View Package is to be composed directly by an Author using an automated authoring system, or to be prepared by pre-established Extraction and Formatting algorithms from the IETM Data Base, without (or with a minimum of) direct human intervention in the specific View-Package generation process (or by some combination of the two processes) will be at the option of the System Acquisition Manager.

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## 1.2 Purpose of This Handbook

For any large-scale weapon system (e.g., an aircraft), many different individual View Packages will be required to fully document system-operation and logistic-support activities (e.g., system installation, maintenance, and training). Acquisition of each of these View Packages will require a Specification, detailing (1) the General Content, Style, Format, and User-Interaction Requirements for the View Package obtained from MIL-M-GCSFUI; (2) Requirements applicable to major classes of View Packages (e.g., Aircraft Engine Manuals) where these have already been promulgated by authoritative Service Specifications and Standards; and (3) the Unique Requirements for Content, Style, Format, and User-Interaction dictated by the particular purpose of the individual View Package.

The purpose of this Handbook is to provide guidance for the preparation of these individual View-Package Specifications, so that System Acquisition Managers may define VP Requirements quickly and effectively for the numerous different specialized increments of Technical Information which will be required. A Handbook of this type has been referred to as a meta-specification: a Specification describing how to write Specifications.

A complete outline for an individual View-Package Specification is provided in Section 3.

## 1.3 Preparation of a View-Package Specification (VPS)

In general, the preparation of a View-Package Specification (a contractual instrument detailing Requirements of an individual VP in such a way that the system Contractor can produce an adequate Technical Information product) will consist of the following steps:

- a. Define View-Package Purpose (e.g., corrective maintenance of a specific subsystem);
- b. Define the maintenance or other tasks to be covered (usually obtained from the LSAR);
- c. Define the Technical Information Content required for the View Package; specifically, select Data Entities (with appropriate attributes and relationships) from the IETM Data Base prepared for the Prime Contractor for the weapon system or equipment involved;
- d. Classify the View Package in terms of types of information presentation involved (e.g., procedures, fault isolation, description, parts data, or any combination of types of information) which would be most effective in enabling the View Package to satisfy its purpose and intended use;
- e. From the general Specification MIL-M-GCSFUI, select appropriate General Content, Style, Format, and User-Interaction Requirements

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applicable to the type of View Package involved. Also, considering the Information-Presentation types involved in the particular View Package, select Content, Format, Style, and User-Interaction Requirements listed in MIL-M-GCSFUI which are applicable to those specific Information-Presentation types.

- f. Establish Unique Content, Style, Format, and User-Interaction Requirements dictated by a specific View-Package purpose to supplement the General Requirements Statements obtained from MIL-M-GCSFUI.
- g. Provide Requirements for the algorithmic approach which will be used for automated extraction of Data Entities from the IETM Data Base.
- h. Provide Requirements for the algorithmic approach which will be used for automated structuring (compilation) of Technical Information into organized form for presentation to end user.
- i. Provide Requirements for the algorithmic approach which will be used for automated formatting of the compiled Technical Information (e.g., for establishment of screen-layout mode specified).
- j. Define Quality Assurance Requirements (based on MIL-M-IETMQA).
- k. Define Requirements for preparation for delivery to the Government of the View Package.

Detailed guidance for carrying out these steps is provided in Section 2 of this Handbook. If the View Package is to be directly generated by an Author using an automated authoring system (an option of the activity acquiring the View Package), steps g and h will not be required.

#### 1.4 View-Package Procurement

The acquisition, use, and configuration management of View Packages necessitate the availability of a standardized IETM Data Base (described by MIL-M-IETMDB) containing all Data Entities required for operation and support by the Government of the weapon system or other equipment involved. As conceived under the Computer-aided Acquisition and Logistic Support (CALS) approach, View Packages may be acquired in several optional fashions, as described in Section 1.4.1.

##### 1.4.1 Procurement and Delivery Options

Acquisition of Technical Information to provide operational or logistic support of military equipment may be carried out by one of several optional approaches. These are as follows:

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- I. Using appropriate View Package Specifications, buy whatever directly authored Interactive Electronic Technical Manual increments are required. Although the Author (equipment Prime Contractor) will need to establish an automated system Data Base, this Data Base will not be acquired by the Government, but will be maintained and used by the Contractor, both for the preparation of IETMs and for other purposes.

Under this option, the Government may specify the basic content of the Contractor's Data Base, and the form in which such data is to be interchanged among the Government and Government Contractors, but may not impose a detailed Specification on Data-Base structure.

- II. Purchasing View Packages (prepared and validated by the Contractor) as well as the IETM Data Base upon which they are based. Purchasing the IETM Data Base may involve either of the following steps:

- A. Delivery to and subsequent maintenance by the Government (with or without update information supplied on a continuing basis by the Contractor);
- B. Title acquired to the IETM Data Base by the Government, but with the Data Base retained and maintained in the Contractor's plant. The Government to be provided with on-line access to the Data Base.

Under option II, the Government will impose a detailed Specification on construction and accessibility Requirements of the IETM Data Base (e.g., MIL-M-IETMDB).

- III. When the IETM Data Base is required by the Government under option II.A or II.B, preparing View Packages using either (1) a fully automated process or (2) one in which the View Package is directly authored by means of an automated authoring station. In such a case, View Packages can be prepared by either:

- A. The Contractor, and delivered as such to the Government, or
- B. The Government.
- C. A combination of the above, i.e., initial delivery by the contractor with some or all maintenance by the government.

This Handbook is intended to guide Government System Acquisition Managers in preparing Specifications for acquisition of View Packages under all of these options.

Table I summarizes the optional procurement approaches. For all of the View Package Acquisition options, the View Package Specifications will be essentially the same in terms of Content, Style, Format, and User-Interaction Requirements.

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TABLE I.

## SUMMARY OF IETM DATA BASE AND VIEW PACKAGE ACQUISITION OPTIONS

SYSTEM OR EQUIPMENT DATA BASE		
NOT ACQUIRED BY GOVERNMENT	ACQUIRED AND RETAINED IN-PLACE	TRANSFER TO GOVERNMENT FACILITY
View Package Directly Authored by Prime Contractor	View Package Directly Authored by Prime Contractor	View Package Directly Authored by Prime Contractor
	View Packages Prepared by Prime Contractor Using Automated (Algorithmic) Approaches	View Packages Prepared by Prime Contractor Using Automated (Algorithmic) Approaches
		View Packages Prepared by Government Using Automated (Algorithmic) Approaches
DATA BASE CONTROL		
Contractor Data Base Not Directly Controlled	IETM Data Base Specified in Detail	IETM Data Base Specified in Detail
DATA INTERCHANGE CONTROL		
Data Interchange Process Controlled	Data Interchange Process Controlled	Data Interchange Process Controlled

## 1.5 Summary of View-Package Composition Process

This Section describes the View Package preparation process, which will be carried out by the equipment Prime Contractor or appropriate Government Activity, in order to indicate the nature and scope of the Requirements which an individual System Acquisition Manager must incorporate into a View Package Specification.

### 1.5.1 Tools Required for View Package Preparation

In general, before beginning the composition of a View Package which adequately supports an end user in the performance of his system-support or system-operation function, the preparing Contractor (or preparing Government activity) must have five tools readily at hand. These are:

- a. An adequate definition of the View-Package Requirements, including the specific purpose of the View Package and a summary of the Data Entities which will constitute the View Package. All applicable Content, Style, Format, and User-Interaction Requirements, both General and Specific or Unique to a given View Package, must be available. (This Requirements definition is provided by the VPS; preparation of this part of the VPS is discussed in Sections 2.2 and 2.3 of this Handbook.)
- b. For most of the acquisition options, an Interactive Electronic Technical Manual Data Base (IETMDB) for the weapon system involved, which has been prepared by the system Prime Contractor in accordance with MIL-D-IETMDB. The IETM Data Base Specification requires composition of the Data Base in such a way that Data Entities may be accessed and extracted in a standard fashion. On-line access to a current and complete Data Entity Dictionary (DED) for the IETMDB will be required.
- c. For those acquisition options involving automated preparation of the View Package, a computer program, approved or provided by the Government, which will permit automated extraction of the relevant Data Entities from the IETM Data Base to compose the View Package. (Discussed in Section 2.7 of this Handbook.)
- d. For those Requirements options involving automated preparation of the View Package, a computer program, approved or provided by the Government, which will permit automated ordering (structuring) of the Data Entities (text and graphics) into a coherent increment of Technical Information adequate to accomplish the purpose of the View Package. (Discussed in Section 2.8 of this Handbook.)
- e. For those acquisition options involving automated preparation of the View Package, a computer program, approved or provided by the Government, which will provide automated formatting (and styling) of the compiled Technical Information in such a way that it is computer-processible, and may be interactively presented to an

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end user by means of an Electronic Display System. (Discussed in Section 2.9 of this Handbook.)

To assure that a View Package has been properly constructed, the preparing Contractor or Government activity must also have available a Government-approved or Government-furnished Electronic Display System (EDS) to permit a series of detailed Quality Assurance tests, including validation and verification of the technical information content. (See Section 2.12 of this Handbook.)

#### 1.5.2 Steps in View-Package Composition

Once the capabilities identified in Section 1.5.1 are available (on-line), the View Package Assembly Process consists of the following steps:

- a. Classify the View Package to identify VP type, and list the kinds of information that it contains and the types of Information Presentation which will be required to present this information to the end user.
- b. Establish the Technical Information Content of the View Package; i.e., identifies those Data Entities which will constitute the technical matter (e.g., corrective-maintenance procedures).
- c. Establish all General Content, Style, Format, and User-Interaction Requirements applicable to this View Package (based on its purpose and types of information presentation that it contains).
- d. Establish all special or Unique Content, Style, Format, and User-Interaction Requirements not covered in MIL-M-GCSFUI, applicable to this View Package, based on any unique or highly specialized features of its type or purpose. (Such Requirements may not exist in all cases.)

(Steps b. through d., above, are not necessarily sequential. They would probably be carried out concurrently.)

For automated VP Construction:

- e. Develop required software programming and perform automated extraction of required Data Entities from the IETMDB.
- f. Develop required software programming and perform automated compilation (structuring) of the View Package.
- g. Develop required software programming and carry out automated process of View-Package Formatting, Styling, and Presentation to the end user.
- h. Carry out required QA and Testing to assure proper VP preparation.

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- i. Transform VP into required form for delivery to the Government.

For direct authoring:

- j. In conformance with Requirements established as a result of steps b. through d., above, assemble the required data, organize it into a rational technical sequence, apply Format, Style, and User-Interaction Requirements, carry out QA procedures and in general author a complete View Package to meet the user's needs.

These steps are summarized in greater detail in the following Sections.

#### 1.5.3 Identification and Extraction of the View Package Data Entities (VP Data Assembly)

The process of identifying the required Data Entities which compose the View Package (Section 1.5.2 a. and b.) will be carried out by the preparing activity in accordance with Section 3.2.1 of the View-Package Specification. The steps which will be involved in preparing Section 3.2.1 for an individual VPS have been introduced in Sections 1.3 a. through 1.3 c. Detailed Requirements for the three steps involved in preparation of Section 3.2.1 of an individual VPS are provided in Sections 2.1, 2.2, and 2.3 of this Handbook.

For either automated Data-Entity extraction or direct Data-Entity extraction by an Author at an automated Work Station, a Data File must be formed, containing all data which will be required by the View Package.

Automated extraction of the required Data Entities from the IETMDB (Section 1.5.2 e.) will be carried out in accordance with Section 3.3.1 of the VPS.

Effort involved in preparation of Section 3.3.1 of the VPS was introduced in Section 1.3 g. Detailed Requirements for preparing Section 3.3.1 of the VPS are provided in Section 2.7.

#### 1.5.4 Compilation (Structuring) of the View Package from the Data Entities

Once a file containing the applicable Data Entities has been established by the preparing activity (including Data-Entity attributes and relationships as provided by the IETMDB), the Data Entities must be sequenced into a coherent statement of the entire series of procedures (or



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other set of Technical Information) constituting the VP: either directly, by an authoring system, or automatically, using appropriate software programming. (Section 1.5.2 f.) This process will be carried out in accordance with Section 3.3.2 of the VPS. The steps involved in preparing Section 3.3.2 of an individual VPS have been introduced in Section 1.3 h.

Detailed Requirements for preparing Section 3.3.2 of the VPS are provided in Section 2.8 of this Handbook.

#### 1.5.5 Style, Formatting, and User-Interaction Procedures for View-Package Technical Information

To arrange View-Package Technical Information into the most comprehensible form (screen format) for interactive viewing by the using technician, the compiled TI must be formatted and styled directly by the Author or a computer program (Section 3.3.3 of the VPS), the detailed directions for which are provided by the General and Unique Content, Style, Format, and User-Interaction Requirements described in Sections 3.2.4, and 3.2.5 of the VPS. The effort involved in preparing these sections of the VPS (introduced by Sections 1.3 e. and 1.3 f. of this Handbook) is described in Section 2.5 and 2.6 of this Handbook.

#### 1.6 Quality Assurance and Compatibility of View Package with Electronics-Display System

Whether the processes of preparing a specific View Package are controlled directly by an Author or are essentially completely automated (Sections 3.3.1, 3.3.2., 3.3.3, and 3.3.4 of the VPS), it will be necessary to perform an adequate series of Quality Assurance Tests (as noted in Section 1.5.2 h.) to assure that the extraction, compilation, and Style and Formatting processes (Author-controlled or automated) have in fact been carried out properly. This series of tests will require the availability of a Government-approved or Government-furnished Electronic Display System which permits viewing of frames in a manner identical to that experienced by the end user. Preparation of Section 4 of the VPS, particularly the Requirement for View Package-EDS compatibility (introduced by Section 1.5.1), is described in Section 2.12 of this Handbook.

#### 1.7 Preparation of View Package for Interchange (Delivery to Government)

When the View Package is complete and operationally usable, it must be recorded (written) on a suitable medium (e.g., nine-track tape, disc, etc.) as prescribed by the acquiring activity, and with prescribed identifying information, for delivery to the Government (Section 1.5.2 i.). Requirements for this effort must be provided in Section 5 of the VPS.

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Preparation of this section of the VPS (introduced by Section 1.3 k.) are presented in detail in Section 2.13 of this Handbook.

### 1.8 The View Package "Shell".

When a View Package is constructed by automated procedures, a number of Data Entities are extracted from the IETMDB (as described in Section 1.5.3). The data file so assembled is then automatically organized (Section 1.5.4) and Formatted (Section 1.5.5) in accordance with General and Specific Requirements based on MIL-M-GCSFUI and, when required, on Unique Requirements formulated by the Acquiring Activity and incorporated into the VPS. The result is a completed and compiled View Package.

However, the Acquiring Activity may desire to purchase a software program (composed of several modules) which contains the capability to perform all of the functions cited above, except that the specific required Data Entities which constitute the Technical Information Content of the View Package will be extracted from the Data Base and formatted for presentation as required at the time of use. Such a program is referred to as a "View Package Shell". Once acquired by the System Acquisition Manager, such Shells could be converted into specific View Packages by exercising the View Package Shell to extract then format the set of required Data Entities for each VP (Section 1.5.2 b.).

View Package Shells could be used to increase flexibility in system logistic support; e.g., for a system which is undergoing detailed modification or to redefine a specific maintenance or operational function for an existing system, by the ability of the View Package Shell to rapidly capture required changes from the Data Base. The use of such shells would require controls to ensure that properly validated and verified information is presented, and that MIL-M-GCSFUI and required Service specifications and standards are not violated.

## 2.SUMMARY OF STEPS FOR CONSTRUCTING INDIVIDUAL VIEW-PACKAGE SPECIFICATIONS

This Handbook is designed to provide as much general guidance as possible for the establishment of Specifications for individual View Packages: both General Requirements, which relate to all or most View Packages; and specific, or Unique, Requirements, which may be required in only specialized or unusual cases. The System Acquisition Manager who intends to acquire a View Package by means of a Specification based on this Handbook must, nevertheless, bear the responsibility for assuring that the Requirements provided by his VPS are complete, comprehensible, and fully applicable for the acquisition of the needed View Package without causing the preparing activity to provide unneeded Technical Information.

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This Section of the Handbook provides guidance for preparing each of the Requirements of the VPS, given in outline form in Section 3 of this Handbook.

## 2.1 Definition of Purpose and Functions of the Individual View Package

The system-operation or logistic-support tasks which the View Package must support dictate not only the technical content of the Manual, but also the Style, Format and User-Interaction features with which the Technical Information which composes the VP will be presented to the end user.

Selection and formulation (generation) of the Data Entities which have been included in the IETMDB will already have been based on an analysis of logistic-support and system-operation Requirements performed during the Integrated Logistic Support (ILS) process which accompanies system design, and, to a greater extent, during the Logistic Support Analysis (LSA) process which accompanies system manufacture. Specifications for the IETMDB (from which the Technical Information Content of the View Package is entirely selected, under most acquisition options) will require that all system-support functions identified in the LSAR will be incorporated into the IETMDB. The LSAR will, in fact, provide the basis for the list of View Packages which will be required, with a summary of their technical functions. The Activity which generates the IETMDB will be required to support this entire list. It is, however, the function of the View-Package Specification to identify the body of Data Entities, attributes, and relationships to be extracted from the IETMDB for incorporation into a given View Package.

## 2.2 View Package Specification

The VP for which a Specification is to be constructed must therefore be classified according to a number of taxonomic factors to permit selection of the applicable Data Entities from the IETMDB.

These factors include:

- a. The system or equipment (or subsystem, part, or individual item of equipment) involved;
- b. The purpose of the VP:
  - (1) Maintenance
    - (a) Maintenance level (O, I, or D)
    - (b) Type of maintenance (corrective, planned, checkout, test, remove and replace, fault isolation);

- (2) Training (on-the-job, schoolhouse, or other training method);
- (3) System operation (combat-weapon system, aircraft, ship, other vehicle, other types of system or equipment, procedures);
- (4) Installation;
- (5) Other forms of logistic support and support procedures.

Where system-support functions represented by specific combinations of the factors cited in this Section have been identified as Requirements by the LSA, all required Data Entities for View-Package composition will be available from the IETMDB.

In addition, this functional classification will permit establishment of the required Information-Presentation Technique categorization which will permit automated selection of General Content, Style, Format, and User-Interaction Requirements from MIL-M-GCSFUI, since Requirements in that IETM Specification are categorized both in General terms and according to Information-Presentation Type; i.e., the General Requirements statements are provided for each of the six information-presentation categories described in Section 2.5.1.

### 2.3 Establishment of View-Package Technical Information Requirements

The Technical Information Content of any particular View Package will depend on the particular purpose of the View Package is intended to serve. The three Services have prepared an extensive set of guidelines which describe these Information Requirements; i.e., the Technical Manual Specifications and Standards or TMSS. Once the View Package function has been carefully established (and delimited), these documents will provide the basis upon which the appropriate Data Entities from the IETMDB will be selected. Examples of such selections are given in the following three Sections.

#### 2.3.1 AF Guidance Specifications for View Package Technical Information Content

- a. MIL-M-5096 Military Specification for Preparation of Checklists/Work Cards; and Manuals: *Functional Check Flight (FCF); Manuals, Inspection Requirements.*
- b. MIL-M-38769 Manuals, Technical: *Work Unit Code.*
- c. MIL-M-38807 Manuals, Technical: *IPB, Preparation of.*
- d. MIL-M-38811 Manuals, Technical: *Methods and Procedures to Preparation of*

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- e. MIL-M-83495 Military Specification: Detailed Manuals, Technical: On-Equipment Sets, Organizational Manual Requirements for Preparation of (for USAF equipment).
- f. MIL-M-87929 Manuals, Technical: Operations and Maintenance Instructions in Work Package Format for USAF Equipment
- g. MIL-M-7700 Manuals, Technical: Flight

### 2.3.2 Navy Guidance Specifications for View Package Content.

#### 2.3.2.1 NAVAIR.

- a. MIL-M-81927 Manuals, Technical: General Style and Format of (Work Package Concept)
- b. MIL-M-81919 Manuals, Technical: Support Equipment, Preparation of
- c. MIL-M-81928 Manuals, Technical: Aircraft and Aeronautical Equipment Maintenance; Preparation of Work Package
- d. MIL-M-81218 Manuals, Technical: Aircraft Engine and Depot Maintenance, Preparation of
- e. MIL-M-81929 Manuals, Technical: Illustrated Parts Breakdown, Preparation of

#### 2.3.2.2 SPAWAR

#### 2.3.2.3 NAVSEA

### 2.3.3 Army Guidance Specifications for View Package Content

#### 2.3.4 Identification of Required Data Entities in the IETM Data Base

As noted (e.g., Section 2.1), the Technical Information Content of the View Package, the Technical Information which guides the technician or operator in the performance of his/her system-support or operation

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function, will consist entirely of organized sequences and cross-linked sets of IETMDB Data Entities.

To establish which of these Data Entities are required for the View Package, the preparer of the VPS must be fully familiar with the Data Base, must have a fully operable IETMDB Data Entity Dictionary, and must be thoroughly familiar with the functional nature of the Data Base involved.

A "Data Entity" consists of any item of system-related Technical Information which forms a rational unit; i.e., one that is not likely to require subdivision. Although the "granularity" of these Entities may vary, the content of a Data Entity will usually be as inclusive as possible, to simplify the process of VP composition. Thus, if the system-maintenance plan, reflected in the LSAR, shows that a certain sequence of nine steps is needed to execute a certain remove-replace function, the Data Entity will consist of a chain of all nine steps; appropriate Data Base linkages will ensure this capability.

Each Data Entity carries a unique identifier, and is also associated by the IETMDB with "attributes"; in the above example, for instance, a Data Entity is associated with a list of setup conditions for the nine-step task.

The IETMDB also relates each Data Entity to every other Data Entity with which it interacts. In the case described above, such "relationships" will be task relationships; for example, the sequence leading to the particular task involved, the following sequence, a checkout procedure on completion of the nine steps, or Cautions, Warnings, maintenance-reporting actions required, and the like.

General Content Requirements (those common to most or all view packages, as defined in MIL-M-GCSFUI) will also be included as input to the Data-Base Extraction Routine, as well as a list of those Data Entities of specific relevance to the system-support function which will be covered by the View Package.

#### 2.3.5 Extraction of Required Information Entities from the IETMDB

As noted, the preparer of the VPS will have a complete listing of Data-Entity identifiers contained in the automated DED. He can, accordingly, call up and view the listings of individual Data Entities and their attributes, and can display pre-established sequences and cross-links (relationships) which the preparer of the IETMDB has constructed. With Software available to him (part of the IETMDB output program), the VPS preparer then can construct in machine-readable form the entire map of Data Entities, their attributes, and their relationships, which will serve as input to the Data-Entity Extraction Routine (Section 3.3.1 of the VPS).

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This map constitutes Section 3.2.2 of the View Package Specification. It will be prepared in standard form, compatible with the Data-Extraction Software. See Section 2.7 of this Handbook.

#### 2.4      Compilation (Structuring) of Text and Graphics Data Entities and View-Package Organization

The machine-readable Data-Entity map described in Section 2.3.5 will provide the input to the Data-Entity Extraction Routine, and also to the Software which performs the Data-Entity sequencing and cross-linking; i.e., to the View-Package Structuring (Compilation) Routine (Section 3.3.2 of the VPS). The System Acquisition Manager who creates the VPS must supplement this Data-Entity map with instructions to the VP Compilation Algorithm providing for complete organization of the entire View Package (e.g., the sequencing of tasks, structuring of descriptive sections which relate to procedures) where this is not already indicated by the IETMDB structure, or where a choice must be made when more than one possibility is made available by the IETMDB.

This VP structure and organization function of the Specification will be prepared in a standardized form, compatible with (and readable by) the View-Package Compilation Software and will constitute Section 3.2.3 of the View Package Specification.

#### 2.5      Establishment of General Content, Style, Format, and User-Interface Requirements

General Requirements (Requirements applicable to most View Packages) for Content, Style, Format and User-Interaction features are contained in MIL-M-GCSFUI. In that Specification, additional Requirements are related to types of information presentation used by the View Packages. The process of selecting applicable General Requirements for a given View-Package Specification consists of:

- a.      Selection of General Requirements statements applicable to all (or essentially all) View Packages.
- b.      Establishment of the type or types of information presentation to be used by a View Package (Section 2.5.1). For example, an O-level corrective-maintenance manual might require presentation of descriptive, procedural, and trouble-shooting information. Each of these types of information presentation must be prepared by the View Package Author in accordance with Requirements in the appropriate Sections of MIL-M-GCSFUI.

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- c. Documented analysis relating these Requirements to the appropriate Data Entities so that the View Package Formatting and Style Software (Section 3.3.3 of the VPS) can apply the Requirements to the appropriate Sections of the VP: This completed analysis constitutes Sections 3.2.4 (Style and Format) and 3.2.5 (User-Interaction Requirements) of the View Package Specification.

#### 2.5.1 Nature of Information-Presentation Categories to the Employed

All View-Package Technical Information will be presented in one or more of the following general information-presentation types (including textual, graphical, and tabular material, and Warnings, Cautions, and Notes):

- a. Procedural Information
- b. Descriptive Information
- c. Troubleshooting Information
- d. Parts Information
- e. Operational Information
- f. Checklists

MIL-M-GCSFUI presents General Content, Style, Format, and User-Interaction Requirements for each of these information-presentation categories which are defined in that Specification. Many Requirements are not, of course, unique to the individual information-presentation categories; e.g., callouts used in presenting parts information will be identical to those presented in a text-graphics module for a corrective-maintenance procedure.

#### 2.5.2 Establishment of Detailed General Requirements Statements

The individual Requirements statements of MIL-M-GCSFUI, both the General Requirements statements and those keyed to one or more of the information-presentation methods identify standard input to the View-Package Formatting and Styling Software (Section 3.3.3) and the Software which establishes the User-Interaction Features of the View Package (Section 3.3.4 of the VPS). The System Acquisition Manager who prepares the VPS will identify relevant Data Entities, thus providing a General Content, Style, Format, and User-Interaction matrix for each component of the VP. These completed requirements matrices constitute Sections 3.2.4 and 3.2.5 of the VPS.

#### 2.6 Establishment of Unique Content, Style, Format, and User-Interaction Requirements

Where Requirements exist for Unique, or unusual, Content, Style, Format, or User-Interaction Requirements due to the unusual nature of a given View Package, e.g., a View Package which represents a situation not covered by Requirements statements of MIL-M-GCSFUI nor by one of the Technical



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Information Content Specifications of the type cited in Sections 2.3.1, 2.3.2, and 2.3.3, the Unique Requirements must be formulated by the VPS preparer, as an addendum to Sections 3.2.4 and 3.2.5.

In such cases, each Requirement must be spelled out in sufficient detail so that:

- a. If a Content Requirement calls for Data Entities not already in the IETMDB, the Contractor generating the View Package can create this information and add it to the IETMDB.
- b. In the case of a Format or Style Requirement, the Contractor generating the View Package can modify the Formatting and Styling Software (Section 3.3.4 of the VP) so that the required display can be automatically created.
- c. In the case of a User-Interaction Requirement, the Requirement can be brought into consistency with existing User-Interaction functions provided by the Electronic Display System. Requirements statements of this type must also indicate the nature of required modifications to the VP Software which establishes the User-Interaction procedures (Section 3.3.4 of the VPS).

## 2.7 Automation of the Data-Entity Extraction Process

This section applies to all automated processes, including the View-Package Shell described in Section 1.8 of this handbook. The software for the extraction of required Data Entities from the IETMDB must possess the following properties:

- a. It must accept as input the standardized machine-readable summary of requested Data Entities described in Section 2.3.5 of this Handbook.
- b. It must be able to extract automatically the identified Data Entities, required in sections 2.4 and 2.5, from the IETMDB and construct a file which can be acted upon by the View-Package Compilation Software (Section 2.8), and by the View-Package Formatting and Styling Software (Section 2.9). Each Data Entity in this file must be accessible by a human operator, who may, when required, establish new Data-Entity links or modify existing links (relationships) already established within the IETMDB.
- c. The Software must conform to the Requirements of DOD-STD-2167, Defense System Software Development, and of DOD-STD-7935.

The Data-Entity Extraction Program intended for use by a VP-preparing Activity must be approved by the Government.

A summary of these Requirements, adapted to the specific View Package involved, will constitute Section 3.3.1 of the View Package Specification.

## 2.8 Automation of the View-Package Compilation Process

VP-Compilation Software developed by the VP-preparing Activity must:

- (a) Order (Structure) the extracted Data Entities into coherent, sequential items of Technical Information, by direct access to the Data-Entity File created by the Data-Entity Extraction Software.
- (b) Organize the individual components of compiled Technical Information into a completed View Package.
- (c) Apply both General and Unique Style, Format, and User-Interaction Requirements (input from the Software discussed in Sections 2.9 and 2.10) to the processes of (a) and (b), above.

Requirements of DOD-STD-2167 and DOD-STD-7935 will apply to this Software.

Comments concerning a Standardized Program for Data-Entity Extraction, presented in Section 2.7, will apply also to a Standardized Program for View-Package Compilation.

A summary of Requirements for a Program for View-Package Compilation will constitute Section 3.3.2 of the View Package Specification.

## 2.9 Automation of View-Package Formatting

Software developed to apply the Format Rules, both General (Section 2.5) and Unique (Section 2.6), to the process of compiling and organizing the View Package (Section 2.8) must:

- (a) Comply with the requirements statements of MIL-M-GCSFUI, as well as to properly designed "Unique" Requirements statements described in Section 2.6, created by the preparing Activity as a result of Unique Requirements expressed in Sections 3.2.1 through 3.2.4 of the View-Package Specification.

In such cases, modular additions to existing Software may be required. The Requirements for such modifications must be detailed.

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- (b) Apply all Format Requirements to (interface directly with) the Software described in Section 2.9 to permit compilation and organization of the View-Package in the required Format and Style.

Requirements of DOD-STD-2167 and DOD-STD-7935 will apply to this Software.

A summary of these Requirements adapted to the specific View-Package involved will constitute Section 3.3.3 of the View-Package Specification.

#### 2.10 Automated Establishment of Required View-Package User-Interaction and Presentation Features

Software required to incorporate User-Interaction and presentation features into the View Package in response to the General Requirements of MIL-M-GCSFUI, or to User-Interaction Requirements unique to a given View-Package, may be constructed separately from the Software modules described in Sections 2.7, 2.8, and 2.9, or may be an integral part of the software.

Such software must be constructed to be compatible not only with the other Software of the View-Package, but also with the operating system and Input/Output features of the Electronic Display System.

Incorporation of VP unique User-Interaction and presentation features must accordingly be:

- (a) limited to those considered essential for View-Package performance.
- (b) approved by the acquiring Activity
- (c) accompanied by how-to-use-this-capability information.

Such Requirements may also necessitate modular additions to existing Software. The Requirements for such modifications must be detailed.

Requirements of DOD-STD-2167 and DOD-STD-7935 will apply to the software. A summary of these Requirements adapted to the specific View Package involved will constitute Section 3.3.4 of the VPS.

#### 2.11 View-Package Architecture

##### 2.11.1 File Structure

File Structure, established by the Software described in Section 2.7 of this Handbook (produced in response to the Requirements of Section 3.2.2 of the View-Package Specification) will be consistent with the File Structure (Data-Entity Files) of the Interactive Electronic Technical Manual Data Base produced in accordance with the Requirements of MIL-D-IETMDB.

#### 2.11.2 File Linkage

File linkages will include both (1) those relationships between Data Entities already explicitly incorporated into the IETMDB and (2) those created during View-Package Compilation and Organization by the Software described in Section 2.8 of the Handbook directly (or by the View Package Author), which are produced in response to Section 3.3.2 of the View Package Specification.

#### 2.11.3 File Access

All files (containing Data Entities) of the View-Package must be accessible by the end user, both directly and through the logical procedure of View-Package Technical Information, to maximize ease of acquiring proper information through as many routes as is required.

#### 2.12 Quality Assurance and Establishment of Requirements for Interface between View Package and Electronic Display System

The View-Package Specification must clearly specify that any View-Package must be completely compatible with the Electronic Display System (EDS) with which it will be used. View-Package Specifications must, therefore, take into account the Electronic Display System requirements, and the EDS capabilities for viewing a VP, as well as the EDS-User Interaction capabilities.

Quality Assurance for View-Package preparation will be governed by MIL-Q-IETMQA, which should be cited in Section 4 of the View Package Specification.

#### 2.13 Requirements for Delivery to the Government)

Requirements for the formulation of the View Package digital data stream for delivery to the Government will be covered in Section 5 of the VPS. Delivery to the Government will be in accordance with the provisions of DoD-STD-2167 or DoD-STD-7935, and with any specific requirements of the acquiring activity. All interchange of View Package information must also conform to the requirements of MIL-STD-1840A.

#### 2.14 Acronym List and Definitions of Terms

An explanation of all Acronyms and unusual terms used in the View Package Specification will be provided as an Appendix to the View Package Specification. The View Package Specification will also include the Requirement for the availability of such information under a HELP category in the View Package itself.

3. OUTLINE AND FORMAT FOR VIEW-PACKAGE SPECIFICATION

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2. APPLICABLE DOCUMENTS

3. REQUIREMENTS

3.1 General Purpose of the Specific Type of IETM

3.1.1 Procurement and Delivery Options

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3.2.1 Functional Description of the Specified IETM Package

3.2.2 View-Package Content Requirements (Selection and Extraction from IETMDB)

3.2.3 Data-Entity Compilation (Ordering) and View-Package Organization

3.2.4 View-Package Style and Format Requirements

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3.3 Data-Extraction, Compilation, and Format/Style Algorithms

3.3.1 Data-Entity Extraction Algorithms

3.3.2 View-Package Compilation Algorithms

3.3.3 View-Package Formatting and Style Algorithms

3.3.4 Algorithms for Establishing View-Package User-Interaction Features

3.3.5 View-Package Architecture

3.3.5.1 File Structure

3.3.5.2 File Linkage

3.3.5.3 File Access

4. QUALITY ASSURANCE

5. PACKING, PACKAGING, AND MARKING

6. APPENDIX. Definitions of Terms.

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