

**Final Report**

**FY96 SUPPORT TO THE  
DEFENSE INFORMATION SYSTEMS AGENCY (DISA),  
CENTER FOR STANDARDS (CFS)  
FOR  
CONTINUING IMPROVEMENT OF THE *DoD HCI STYLE GUIDE***

Prepared for DISA CFS  
by

L. W. Avery  
D. T. Donohoo  
J. A. Sanchez  
D. A. Gellert

30 September 1996

Prepared by  
Pacific Northwest National Laboratory  
Operated for the U.S. Department of Energy  
by Battelle

**MASTER**

**DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED** <sup>HH</sup>

## DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

*PACIFIC NORTHWEST NATIONAL LABORATORY*  
*operated by*  
*BATTELLE*  
*for the*  
*UNITED STATES DEPARTMENT OF ENERGY*  
*under Contract DE-AC06-76RLO 1830*

**DISCLAIMER**

**Portions of this document may be illegible  
in electronic image products. Images are  
produced from the best available original  
document.**

### DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

## CONTENTS

1.0	INTRODUCTION.....	1
1.1	Background .....	1
1.2	Objectives for FY96.....	1
1.3	Report Organization.....	2
2.0	PERFORMANCE OF TASKS .....	3
2.1	Task 1 - <i>Design Checklist</i> Revision .....	3
2.1.1	Objective .....	3
2.1.2	Technical Approach .....	3
2.1.3	Results .....	4
2.2	Task 2 - Exploration of Approaches for Computerization of Design Checklists.....	5
2.2.1	Task 2 Background .....	5
2.2.2	Objectives.....	5
2.2.3	Technical Approach .....	6
2.2.4	Results.....	6
2.2.5	Recommendations and Conclusions .....	20
2.3	Task 3 - Exploration of Future Directions for the <i>Style Guide</i> .....	21
2.3.1	Task 3 Background .....	21
2.3.2	Objective .....	23
2.3.3	Technical Approach .....	23
2.3.4	Results.....	23
2.3.5	Conclusions.....	33
2.3.6	Recommendations .....	34

3.0 SUMMARY .....37

4.0 RECOMMENDATIONS.....39

Attachment 1 U.S. Department of Defense *Human-Computer Interface Style Guide Design Checklist*

Attachment 2 User Survey on the *DoD HCI Style Guide*

Attachment 3 Reference List

### FIGURES

Figure 1 Conceptual Model Using a Checklist as a Compliance Tool .....8

Figure 2 Conceptual Model of Using a Style Guide as a Design Tool .....10

Figure 3 Survey Data.....26

### TABLES

Table 1 Comparisons of the *DoD HCI Style Guide* to the *User Interface Specification for the DII* and the *TED™ CDE Style Guide*.....32

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The Defense Information Systems Agency (DISA) Center for Standards (CFS) has the responsibility for encouraging standardization and openness of U.S. Department of Defense (DoD) information systems. One of the vehicles that the CFS uses to carry out this responsibility is the *Technical Architecture Framework for Information Management (TAFIM)* (14). The *TAFIM* is a multivolume set of guidelines, managed and updated by CFS, that addresses topics important for the development of open systems for military use. Volume 8 of the *TAFIM*, version 3.0, contains the *DoD Human-Computer Interface (HCI) Style Guide* (12). The *DoD HCI Style Guide* will be referred to as the *Style Guide* in this report.

The *Style Guide* provides guidelines for designing the HCI for DoD information management systems. The Pacific Northwest National Laboratory (PNNL)<sup>1</sup> has been updating the research basis and the guidelines contained in the *Style Guide* annually for the last 4 years. This report describes PNNL work performed for DISA CFS during fiscal year 1996 (FY96).

### 1.2 OBJECTIVES FOR FY96

The objectives for FY96 were to provide support to DISA's mission of continued enhancement of *TAFIM* Volume 8 through performing the following tasks:

- Task 1 - Update the *DoD HCI Style Guide Design Checklist (Design Checklist)* (8).
- Task 2 - Explore computer-based methods for the deployment of the *Design Checklist*.
- Task 3 - Explore the long-term direction for the *Style Guide*.

### 1.3 REPORT ORGANIZATION

This report is organized into the following sections:

- 1.0 Introduction, including background and FY96 objectives
- 2.0 Performance of tasks, including Task 1 to revise the *Design Checklist*, Task 2 to explore approaches for computerization of checklists, and Task 3 to explore future directions of the *Style Guide*.

---

<sup>1</sup> Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle under Contract DE-AC06-76RLO 1830.

3.0 Summary of the results of the three completed tasks

4.0 Recommendations for future efforts

Attachment 1—the updated *Design Checklist*

Attachment 2—the *User Survey on the DoD HCI Style Guide*

Attachment 3—the Reference List.



## 2.0 PERFORMANCE OF TASKS

### 2.1 TASK 1 - *DESIGN CHECKLIST* REVISION

#### 2.1.1 Objective

The objective of this task was to revise the *Design Checklist* associated with the *Style Guide*, bringing it into harmony with the current version of the *Style Guide*.

#### 2.1.2 Technical Approach

**2.1.2.1 Step 1 - Initial Planning** - Initial planning for the revision of the *Design Checklist* determined project tasks and schedule including: tasks to be accomplished, responsibilities, deliverables, and deliverable dates. The planning focused on developing a task plan to update the *Design Checklist* that would ensure that each checklist item would be revised and/or updated to accurately reflect the initial intent of the guidelines in the source document, *Style Guide*.

This initial planning phase also included an evaluation of the utility of the overarching version of the *Design Checklist*. It was determined that this overarching version had little utility and should not be included in the revised *Design Checklist*.

#### 2.1.2.2 Step 2 - Development of Draft 1 *Design Checklist*

##### a. Development of Document Template and Styles (Microsoft® Word)

The original design checklists were in WordPerfect® 5.2 format. Because the *TAFIM* is published in Microsoft® Word, the *Design Checklist* needed to be migrated to Word 6.0. A Word 6.0 template and styles for the revised *Design Checklist* were developed and the previous checklists were then converted.

##### b. Development of Draft 1 *Design Checklist*

The PNNL and DISA draft version style guides were compared and differences noted to aid in developing draft 1 of the design checklist. Chapters 4 -13 were reviewed according to the initial planning focus for draft 1. Draft 1 was incorporated into the Word 6.0 document template and styles, edited, and peer reviewed.

### **2.1.2.3 Step 3 - Development of Draft 2 *Design Checklist***

#### **a. Planning for Draft 2 *Design Checklist***

The review of draft 1 of the design checklist determined that the checklist items should be more detailed. This detail would incorporate more of the content and intent of the *Style Guide*. Draft 1 would thus be modified to include the planned enhanced level of detail. The project schedule was revised and applicable deliverable dates modified.

#### **b. Draft 2 *Design Checklist* Development**

The draft 1 design checklist was reviewed according to the planning focus for draft 2, and the draft 2 design checklist was developed. The level of detail for some checklist items was increased as planned. In addition, the "Introduction" and "Using the Checklist" sections of the previous *Design Checklist* were reviewed, revised, and prepared for incorporation into the draft 2 design checklist.

#### **c. Internal Peer Review and Quality Assurance Check of Draft 2 *Design Checklist***

A quality assurance check and an internal peer review were conducted for the edited draft 2 design checklist. Applicable revisions were completed.

**2.1.2.4 Step 4 - Final Draft *Design Checklist* Preparation and Submission** - The draft *Design Checklist* was prepared from the draft 2 design checklist and internally approved for submission to DISA for review and comment.

**2.1.2.5 Step 5 - Final *Design Checklist* Preparation Actions** - Based on comments received from DISA and an internal PNNL review, the final draft was revised and submitted.

### **2.1.3 Results**

Task 1 resulted in a *Design Checklist* that accurately reflects the content and intent of the *Style Guide*. This update accomplished the following:

- A conversion of the *Design Checklist* from WordPerfect® 5.2 files to Microsoft® Word 6.0
- The production of a smaller checklist through the removal of the overarching version of the previous *Design Checklist*.

- A revision of the *Design Checklist* that:
  - Provides checklist items that better reflect the *Style Guide* content and meaning.
  - Provides more specificity to checklist items.
  - Provides the user with more specific instructions.

The updated *Design Checklist* is included as Attachment 1 to this report.

## **2.2 TASK 2 - EXPLORATION OF APPROACHES FOR COMPUTERIZATION OF DESIGN CHECKLISTS**

### **2.2.1 Task 2 Background**

In a software applications development environment, human-computer interface design guidelines have been used for two different but related purposes. These guidelines are used to provide the developer with design principles that can be used in making design decisions, and they have been used to evaluate the application's compliance with design criteria specified by a user organization. These design principles are necessary to ensure that the product is developed according to sound human factors engineering principles and that the evaluation measures the compliance with product specifications related to the use of the software application. The goal of both of these uses of design guidelines is to produce a software application that will ultimately lead to mission success and user acceptance.

One way that guidelines have been applied in the development of software applications is through the use of design checklists. Design checklists are usually composed of abbreviated statements of design guidelines, formulated as brief excerpts or questions. Such a checklist grew out of the need to provide a human factors review of the emerging DoD software applications. This *Design Checklist*—abstracted from the *Style Guide*—is expected to serve as a formal template for the human factors review of the HCI of a system under development and should be used by human factors specialists to assess design features. For a specific or particular review, questions selected from the checklist depend on the objectives, issues, and questions chosen for the test review. A key issue regarding this design checklist, as well as others, is how to best tailor and employ checklist questions/items as design and evaluation aids. The following paragraphs discuss one way to enhance checklist use—computerization.

### **2.2.2 Objectives**

The objectives of this task were to identify and discuss methods for computerizing checklists.

### 2.2.3 Technical Approach

This task included a review of the literature that pertain to the characteristics and delivery of design checklists. The emphasis was to investigate the issues surrounding the computerization of design checklists. A conceptual model of the use of a computerized design checklist for design information and compliance was developed, and the advantages and disadvantages of various types of electronic delivery were explored. The following sources of information were accessed in the conduct of the literature review:

- The internet
- Hanford Technical Library
- University of Washington Library
- Intellectual discussions with Information Sciences Department scientists from PNNL.

Information gathered from the above resources was used to formulate the following results.

### 2.2.4 Results

The following sections discuss how a computerized design checklist may be used, various implementation scenarios, and how the developer/designer can optimally apply the checklist during an application development project. Methods of distribution are also discussed,—ranging from traditional diskettes to interactive applications across the internet, hardware/software issues, and the strengths and weaknesses of these distribution methods. Finally, a recommended distribution method for the *Design Checklist* is offered based on the research performed during this task.

**2.2.4.1 Design Checklist Usage Strategies** - HCI guidelines and the checklists that often accompany these guidelines have been traditionally delivered as hardcopy documents. This form of delivery has limited their availability and utility to evaluators and designers of software applications because many aspects of the design of human-computer interfaces are difficult to communicate with this static, written media. In this section, the use of human factors checklists implemented as a part of an on-line human-computer interface guidelines document, as well as using an electronic style guide, will be discussed.

Prior to discussing how an electronic design checklist may be used in the application development environment, features important to its development will be described. A first assumption is that the design checklist will be integrated into a software application that contains an electronic human-computer interface style guide. This integration will ensure that both checklist items and the information upon which the items are based are easily accessed

by the developer/evaluator. A second assumption is that the electronic human-computer interface style guide application will run on both the application development platform and the delivery platform to facilitate its use by both developers and evaluators.

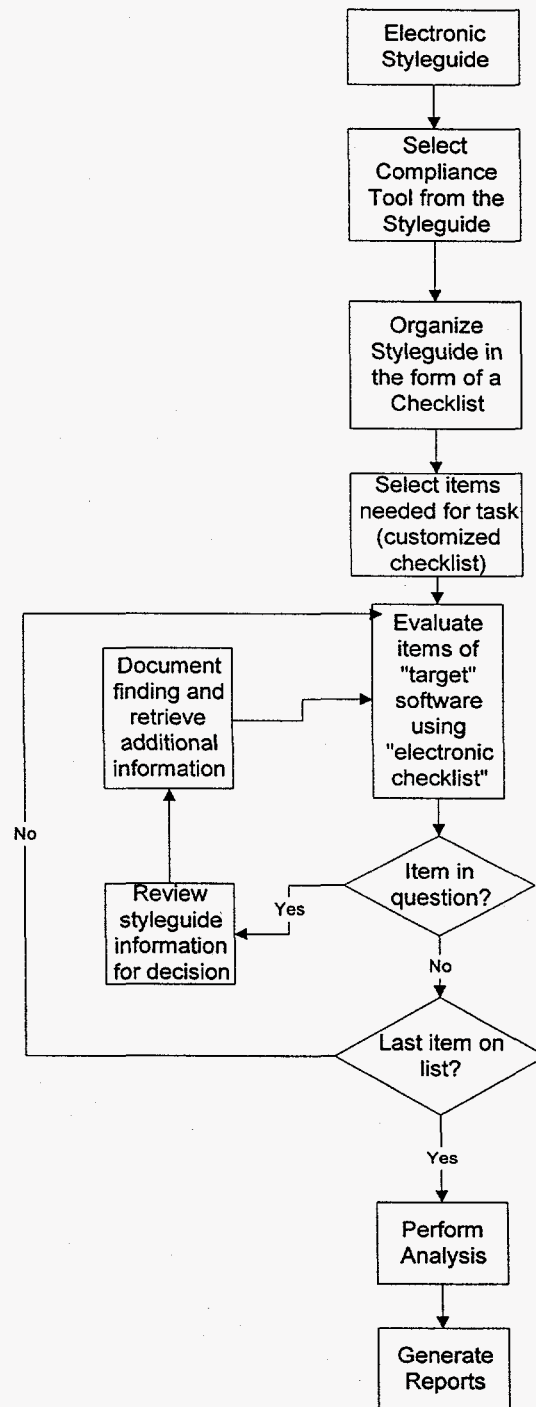
There are two major advantages in providing the HCI design checklist as an on-line software application. First, for guidance or evaluation information to be useful to developers or evaluators, it must be available. On-line presentation of this information permits easy access for the users of an electronic design checklist that is always at the workstation. Second, presentation of the information on the development platform or the delivery platform permits a user to see examples of the HCI guidelines as they might be implemented in an application. Much of the information in HCI guidelines is open to interpretation and is difficult to communicate in written form. Presentation of this material on-line also permits the guidelines developer to use the resources of the computer to more effectively communicate the intent of the information contained in the checklist.

Other characteristics of the electronic design checklist include the use of hypertext or hypermedia to facilitate search for related items and to move easily from one reference document to another, the use of interactive examples to show the designer or evaluator the expected actions as well as the look of the interface, and the ability to organize guidelines and compliance information related to specific design issues. An electronic design checklist should also have the ability to generate reports for use in making design or compliance decisions. A basic assumption for the remainder of this discussion is that one electronic design checklist can be developed to satisfy both the compliance and design guidance purposes.

a. Style Guide/Design Checklist Used as a Tool For Compliance

Figure 1 presents a conceptual model for using an electronic style guide and design checklist as a compliance tool. Effective use of an on-line design checklist for compliance purposes includes the capability to access design criteria quickly, to compare application design components to the HCI guidance or design criteria, and to generate a report that will communicate to the application designer deficiencies in the application with respect to the criteria.

In the conceptual model presented in Figure 1, it is assumed that the style guide is first accessed using normal selection processes in a graphical user interface. Once selected, an evaluator would indicate that the style guide is to be used as a compliance tool. Used as a compliance tool, the style guide information is formatted as a checklist, and the user is permitted to define a scenario which specifies design issues that will be addressed during the evaluation. The development of the scenario provides a means to tailor the checklist to the specific purposes of the evaluation. A next step in the model



**Figure 1** Conceptual Model Using a Checklist as a Compliance Tool

process is to inspect the software application being evaluated and compare its design against the criteria contained in the scenario. When the software does not comply with a criterion, features of the compliance tool permit the evaluator to mark the location in the application, indicate the criterion that is not being met, and provide direction for correcting the deficiency. The evaluator is also permitted to link to related issues to provide more comprehensive guidance to the designer. The evaluation process continues until all HCI components of interest have been evaluated.

Upon completion of the software inspection, the evaluation continues with an analysis of the HCI discrepancies. The compliance tool will assist the evaluator in listing and organizing the discrepancies noted during the software inspection. This analysis will permit the evaluator to extract all discrepancies and organize them for review by the application developer. In the model, this information would be documented in a report to the designer. This report would contain a list of the discrepancies, their location in the application, the related design guidance, and a recommended design fix, if available. An on-line version of this report may allow the application developer to replay the scenario used to conduct the evaluation to locate and fix places where HCI criteria have not been met.

b. Style Guide/Design Checklist as A Tool For Design

The concept of using an electronic style guide as a design tool is closely aligned to the application design process and the application designer's information needs. The design guidance needs to be organized to support the information needs for the application designer. Figure 2 presents a conceptual model of an electronic style guide as a design tool.

In this model, the electronic style guide is started as other applications in the development environment. At this point in the model, the application developer or designer will indicate that the style guide will be used for design guidance. This selection organizes the style guide information in a manner that is consistent with the application development process. The model also assumes that the designer can limit the style guide information to only the topics of interest for the design. In this format, the designer has quick access to design information related to different components of the user interface design. For example, if the designer is developing a drag and drop operation, access to information related to icon selection, selection action, and the look of the object during the various phases of the drag and drop operation would be available. The electronic style guide would take advantage of the computer's ability to present guideline examples interactively and to provide supporting design information

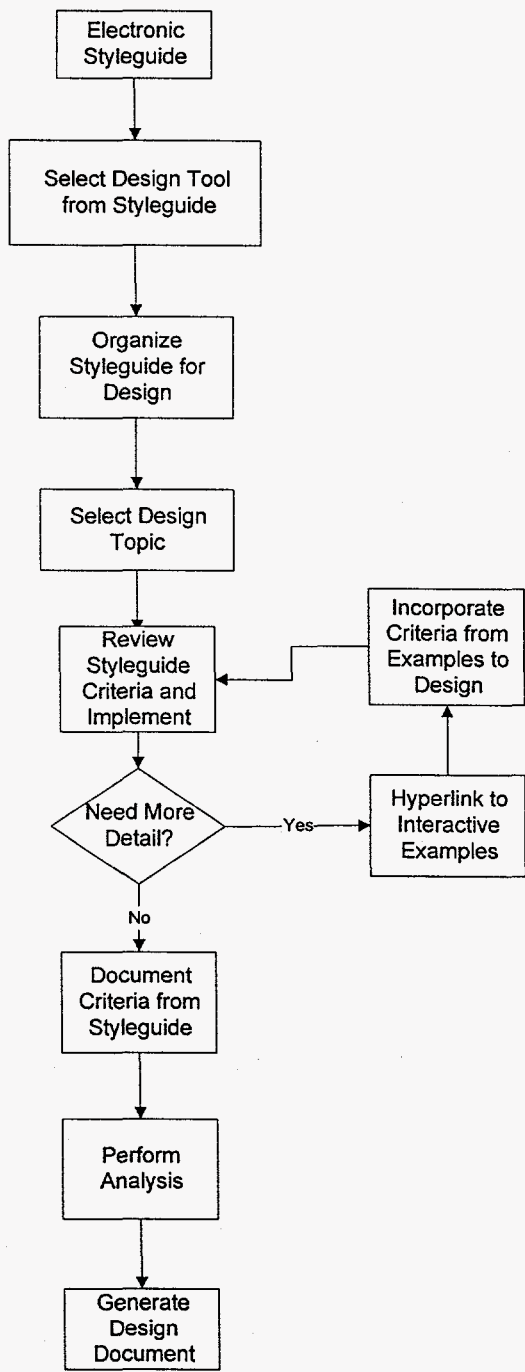


Figure 2 Conceptual Model of Using a Style Guide as a Design Tool



through hypertext and hypermedia links. When a design decision has been made, the design tool provides the capability for the developer to document these decisions and indicate the guidance that was used in arriving at the design decision.

After completion of the design, the developer can generate a report indicating what user interface issues were addressed in the design, the design decisions made, and the design guidance used to arrive at the resulting design. This report may be organized in a way that will facilitate the evaluation of the design against the specified design criteria at a later date.

Utilization of a style guide that has the ability to be effectively used by both the design and evaluation functions should improve the communication of design requirements and criteria, and facilitate the resolution of deficiencies found in the user interface design.

**2.2.4.2 Methods of Distribution** - Once the style guide/design checklist application has been created, the application needs to be distributed to users. There are basically two main methods of distributing applications to users: 1) Traditional Storage Media, e.g., Diskettes, CD-ROM, and 2) Point-to-Point Protocol, e.g., Internet, FTP, BBS, etc. This section will describe options for each method along with their advantages and disadvantages.

In addition, a "base" hardware/software configuration should be maintained for the users of the style guide/design checklist application. This configuration represents features currently present on a typical personal computer.

Minimal hardware requirements should consist of a CPU (with a 3.5" diskette drive, hard drive(at least 1.0Gb) and 16Mb(preferably 32Mb) of Random Access Memory (RAM)), SVGA (17") Monitor, Keyboard and Mouse, CD-ROM drive, a sound card, speakers, and a modem (preferably 28800 bps).

Software requirements should contain the appropriate operating system—software that allows the user and applications installed to communicate with the computer hardware, for example, Novell NetWare, XENIX, OS/2, Windows® 95, and Windows NT™. The style guide/design checklist software can easily be written to run on any computer platform. To develop the application to run on a PC, the application can be written in applications such as Visual Basic and Access (for data storage) to be used in both the Windows® and MS-DOS environments. For the Macintosh, the application can be written in SuperCard or PowerBuilder; and for a UNIX Machine, the application can be written in C.

**2.2.4.2.1 Traditional Storage Media 3.5" Diskette** - An electronic style guide software application can be easily distributed via 3.5" diskette. The application contains an initial installation file that will copy the appropriate files from the diskette to a hard drive, and prepare the executable application to be run by double-clicking an icon or by typing a command. Once the application is running, the user can then perform all work from the hard drive. Any work that is saved will be saved to a database file also located on the hard drive. After the task is completed, the database file can be copied back onto a diskette and sent to other designers, developers and evaluators for review.

*Hardware/Software Issues:*

No additional issues.

*Advantages/Disadvantages:*

Cost is the greatest benefit in using diskettes as a distribution method. Diskettes are relatively inexpensive to purchase and ship.

Disadvantages include:

- Data storage capacity is small.
- Multiple disks are needed if the application is large.
- Application development is platform-dependent.
- Application is very slow if run from a diskette.
- Distribution for a large market is slow.
- Upgrades for mass distribution are time-consuming and inefficient.

b. Compact Disc Read-Only Memory (CD-ROM)

The CD-ROM is a data storage medium using the same physical format as audio compact discs. CD-ROM is popular for distributing large databases and software applications. The maximum capacity is approximately 600 megabytes.

*Hardware/Software Issues:*

No additional issues.

*Advantages/Disadvantages:*

CD-ROM technology can store large amounts of data, and software can easily be run from the CD-ROM drive. Usually, only one CD-ROM is needed for distribution; therefore, shipping costs are relatively low. After an initial master CD has been "burned," each copy costs about a \$1.00 to produce (the cost of a writable CD).

Disadvantages include:

- CD-ROM discs and drives are read-only.
- Upgrades consist of a new CD-ROM shipped to each user.
- To write to a CD-ROM, it is necessary to have a Read/Write Drive (relatively new technology, somewhat expensive).
- Every upgrade requires that a new master CD-ROM be created, requires a special machine, and this may be expensive.
- Not all users may have CD-ROM drives.

**2.2.4.2.2 Point-to-Point Protocol** - There are five basic methods for point-to-point protocol delivery—internet download, internet application, e-mail, file transfer protocol, and modem. Each is discussed below.

a. Internet Download via World-Wide Web (WWW)

The Internet can be defined as any set of networks interconnected with routers (a device that forwards traffic between networks—the forwarding decision is based on network layer information and routing tables, often constructed by routing protocols). This is a three-level hierarchy composed of backbone networks (e.g., ARPAnet, NSFNet, MILNET), mid-level networks, and stub networks. These include commercial (.com or .co), university (.ac or .edu), other research networks (.org, .net), and military (.mil) networks and span many different physical networks around the world with various protocols, including the Internet Protocol.

The style guide software application will reside on a server. The user needing to obtain the application must access the internet, locate the correct Uniform Resource Locator (URL) address, and then download the software onto the local hard drive. Once the application has been downloaded, the user can install its components to run the system from the local machine.

*Hardware/Software Issues:*

A network card should be installed if the system is to communicate via company's Local Area Network (LAN) and the internet.

A software application called a "browser" (an application designed to view and navigate hypertext information on the internet) should be included.

Users not hooked up to their company's LAN should subscribe to an Internet Service Provider (a company that provides access to the Internet).

*Advantages/Disadvantages:*

Advantages to using the internet WWW for downloading software are:

- No shipping costs.
- No diskettes or CD-ROMs to purchase and/or create.
- Easy connection to the internet for downloading applications. User will not have to wait to receive the software by regular mail.
- Relatively inexpensive to reach very large numbers of people, in contrast to traditional standards of software distribution sent by mail.
- Upgrades can easily be distributed; software upgrades are sent to a Web server and users could be notified by e-mail that upgrades are available on the WWW.
- Once downloaded, the user can access other information anywhere on the WWW by the way of hyperlinks.

Disadvantages include:

- Not all users have access to the internet.
- Downloading time could be lengthy, depending on transmission bandwidth and size of the application.
- When servers go off-line, the application download will be interrupted.

b. Internet Application

An internet application is a complete, self-contained application that performs a specific function directly for the user. This application can be accessed by way of a WWW browser.

The style guide software application resides on a Web server. The user wishing to run this application must access the internet, locate the correct URL address from the WWW, and begin running the application. This application can run in the background while evaluating or developing another software application. When the user needs to access the electronic style guide, all that is needed is to open that window and bring it forward. Information that needs to be saved can be saved either to the local hard drive or on a diskette.

*Hardware/Software Issues:*

A network card should be installed if the system is to communicate via company's Local Area Network (LAN) and the internet.

A software application called a "browser" (an application designed to view and navigate hypertext information on the internet) should be included.

Users not hooked up to their company's LAN should subscribe to an Internet Service Provider (a company that provides access to the Internet).

*Advantages/Disadvantages:*

Advantages include the following:

- No shipping costs.
- No diskettes or CD-ROMs to purchase and/or create.

Software upgrades are automatic. The upgrade replaces the file on the Web server. The software will be current each time the user accesses the application from the WWW. No downloading of software needed.

- No impact on local system resources.
- Potentially platform-independent.

Disadvantages include:

- Current technology is in its infancy and, at present, is very cumbersome and slow.
- Not all users have access to the internet.
- When servers go off-line, the checklist cannot be accessed.
- Response time is dependent on communications bandwidth (slow modem, slow response time), type of server application resides, number of users, time of day.

c. E-Mail

Electronic messages are automatically passed from one computer user to another, often through computer networks and/or via modems over telephone lines.

The design checklist/style guide application is sent by way of an attachment to an e-mail message. Once the e-mail is received, the user needs to save the attachment to the local system hard drive and then proceed to install the application.

*Hardware/Software Issues:*

An E-mail application, e.g., cc:mail, Eudora, MS Mail, etc., should be included in the system software.

*Advantages/Disadvantages:*

Advantages include:

- No shipping costs.
- No diskettes or CD-ROMs to purchase and create.
- Users will not have to wait to receive the software by regular mail.
- Relatively inexpensive to reach very large numbers of people, in contrast to traditional standards of software distribution sent by mail.
- Upgrades can easily be distributed by creating a mass distribution list and sending to all on the list.

Disadvantages include:

- Large applications attached to a mail message are discouraged and take a very long time to reach intended audience.
- Some E-Mail services do not handle attachments appropriately. Therefore, if a message was sent to a user with the software application attached, and the user's E-Mail didn't handle the attachment appropriately, the attached application cannot be used.
- If the distribution list were too large, E-Mail service could be tied up and would not deliver messages for days.
- Upgrades and distribution management could be burdensome.
- Data transfer is unreliable for large applications (more than 2Mb) and not recommended.

d. Internet File Transfer Protocol (FTP)

FTP is a client-server protocol that allows a user on one computer to transfer files to and from another computer over a Transmission Control Protocol over Internet Protocol (TCP/IP) network. Also, FTP is the type of client program the user executes in order to transfer files.

A client server is a common form of distributed system in which software is split between server tasks and client tasks. A client sends requests to a server, according to some protocol, asking for information or action, and the server responds. There may be either one centralized server or several distributed ones.

*Hardware/Software Issues:*

A network card should be installed if the system is to communicate via company's Local Area Network (LAN) and the internet.

Users not hooked up to their company's LAN should subscribe to an Internet Service Provider, which will provide access to FTP sites. All access to the internet will provide a protocol to FTP as well as other less popular resources, e.g., Gopher, Telnet, news, etc.

*Advantages/Disadvantages:*

Advantages include the following:

- No shipping costs.
- No diskettes or CD-ROMs to purchase and create.
- Easy connection to the internet for downloading applications. User will not have to wait to receive the software by regular mail.
- Relatively inexpensive to reach large numbers of people, in contrast to traditional standards of software distribution sent by mail.
- Upgrades can easily be distributed; software upgrades are sent to a server and users could be notified by e-mail or regular mail that updates are available on the internet via FTP.
- Data transfer is reliable, especially for large applications.

Disadvantages include:

- Not all users have access to the internet or TCP/IP.
- If servers go off-line, it is difficult to access server for download.
- The FTP address, user ID, password, and knowledge of availability of the application must be distributed.

e. Modem (via Bulletin Board System - BBS)

The BBS is modeled after a physical piece of board upon which people can pin messages written on paper for general consumption. Similarly, a computer and associated software can provide an electronic message database or bulletin board where people can log in and leave messages. Messages are typically split into topic groups similar to the newsgroups on Usenet, which is similar to a distributed BBS. Any user may submit or read any message in these public areas.

Apart from public message areas, a BBS may provide archives of files, personal electronic mail, and other services or activities of interest to the bulletin board system's operator. Thousands of local BBSs are in operation throughout the world. These BBSs are usually run by amateurs for entertainment out of their homes on MS-DOS



boxes with a single modem line each. Although BBSs have traditionally been the domain of hobbyists, an increasing number of BBSs are connected directly to the Internet; and many BBSs are currently operated by government, educational, and research institutions.

*Hardware/Software Issues:*

No additional issues.

*Advantages/Disadvantages:*

Advantages include:

- No shipping costs.
- No diskettes or CD-ROMs to purchase and create.
- Easy connection to the BBS for downloading applications. User will not have to wait to receive the software by regular mail.
- Relatively inexpensive to reach large numbers of people, in contrast to traditional standards of software distribution sent by mail.
- Upgrades can easily be distributed; software upgrades are sent to a server and users could be notified via e-mail or regular mail that upgrades are available on the BBS.

Disadvantage include:

- The only connection is by modem.
- Response time is dependent on communication bandwidth.
- Phone lines may be unstable.
- Only files can be downloaded; there is no access to other information.
- System Administrator support is necessary to maintain BBSs.
- BBS are not a current standard, and remains unreliable.
- Availability of the application and the telephone number must be distributed.

## 2.2.5 Recommendations and Conclusions

A feasibility study should be performed to continue exploring methods to automate the *Style Guide* and *Design Checklist*. Based on the discussion above, all methods seem to be appropriate as a foundation for distributing an electronic style guide.

In order to take full advantage of computerization, the following assumptions must be made:

- Computing technology is relatively current.
- Computing environment is connected to a LAN and to the Internet (via high speed lines).
- Evaluators and designers are familiar with hypertext (A term for a collection of documents (or "nodes") containing cross-references or "links" which, with the aid of an interactive browser program, allow the reader to move easily from one document to another) technology.
- Evaluators and designers are familiar with the World Wide Web.

Based on the assumptions above, it appears that any option related to the Internet may present the best solution because it offers:

- distribution to a large audience
- cost savings - in postage and distribution management
- platform independent (fits either UNIX, Macintosh, or PC)
- current information on every logon session
- immediate access to all upgrades and other relevant information
- timely feedback from evaluation back to design/development.

Currently, the ability to download software from the internet remains the better choice (at least for the next 2-3 years). As technology progresses running application directly from the internet may provide a viable alternative. Inconveniences are apparent when the server becomes off-line, if this happens any of the other options can be used as a temporary solution.

The main objective of design style guides is to provide relevant information to designers/developers in order for them to produce a product that is useable.

Designers/developers do not have the luxury of searching for information and then interpreting the information before implementation. Designers/developers need a mechanism in place to access organized information quickly, document the design, and then implement. Better delivery of design information would allow more time to be spent on actual development.

To be conclusive, all options must be examined and close collaboration with HCI professionals must take place in developing the electronic style guide. Once developed, implementing an electronic style guide, as recommended above, will provide the necessary tools for a project development team to meet all required project specifications.

### **2.3 TASK 3 - EXPLORATION OF FUTURE DIRECTIONS FOR THE *STYLE GUIDE***

#### **2.3.1 Task 3 Background**

The *Style Guide*, which is now Volume 8 of the *TAFIM*, Version 3.0, was developed to provide design guidance in the development of user interfaces for software application across the DoD. The *Style Guide* was originally developed in 1990 as the *Human Factors Design Guidelines for the Army Tactical Command and Control System (ATCCS) Soldier-Machine Interface*, Version 1.0 (6). The purpose of these ATCCS Guidelines was to provide the Army command and control system developer with a set of user-computer interface guidelines. In fulfilling this purpose, the document provided a set of overarching guidelines focused on designing the user-computer interfaces that would enhance soldier performance. The ATCCS Guidelines were intended to address design attributes that were common to all Army command and control systems. In 1991, the ATCCS Guidelines were added as an Appendix to Version 2.0 of the *Style Guide* (10) and, subsequently, the two documents were merged. Version 3.0 of the *Style Guide* (11) was included in the *TAFIM, Version 2.0* (13), as Volume 8 in 1994.

The purpose of the *Style Guide* as a part of the *TAFIM* is to provide a common framework for HCI design and implementation. A long-term goal for the framework presented in the *Style Guide* includes implementing user-interface options that will be standardized, enabling all DoD applications to appear and operate in a reasonably consistent manner. It is expected that development of user interfaces for DoD software applications, consistent with the guidance contained in the *Style Guide*, will result in higher productivity, reduced training time, and reduced development time—from use/reuse of *Style Guide*-compliant software modules. It is further expected that the behavior and appearance of user interfaces developed for the DoD will be specified by tailoring commercially available graphical user interface (GUI) styles with the guidance contained in the *Style Guide*. Thus, the specific look and feel of each DoD organization's application software would be detailed in domain-specific style guides.

The effectiveness of the *Style Guide* to achieve the DoD goals for the software application interfaces and its appropriateness for inclusion in the *TAFIM* have been questioned in recent years. The *TAFIM* was created to promote the use of common principles, assumptions, and terminology in the specification and development of software applications; to define a single structure for system components; and to encourage the development of information systems in accordance with common principles to permit DoD-wide integration and interoperability. Though the *TAFIM* does not specify a specific architecture, it proposes a technical reference model that promotes an open systems environment as a basic element of technical architectures for military systems. Objectives of this model include:

- improved user productivity
- improved development efficiency
- improved portability/scalability
- improved interoperability
- vendor independence
- reduced life-cycle costs
- improved security
- improved manageability.

Improvements in user productivity are expected to come from more consistent user interfaces in terms of appearance, behavior, and predictability; integrated applications that behave in a logically consistent manner across user environments; and data sharing through the use of standard databases.

Ambiguity concerning the role of the *Style Guide* has also been introduced because of the availability of user-interface style guides associated with commercial development environments and the development of domain-specific style guides for operational organizations within the DoD.

The role of the *Style Guide* and the military software development environment has changed significantly since its introduction. As a consequence, the *Style Guide* may not be serving its users in the most effective manner to achieve the openness and usability goals stated in the *TAFIM*.

### 2.3.2 Objective

The objective of Task 3 was to assess the needs for the content and form of the *Style Guide* in the future to better meet the needs of its user community.

### 2.3.3 Technical Approach

The nature and scope of any future modifications to the *Style Guide* should be based on those actions that will result in delivering more effective and open user interfaces to the military environment. The success of the *Style Guide* in the future will depend on its ability to deliver information appropriate to its user in a form that will result in the development of consistent and usable interfaces. The information reported here is a result of several short tasks. These tasks attempted to identify the attributes of a user-interface style guide that will lead to achieving the objectives stated above. Four subtasks and the preparation of this report were completed as a part of this task:

- Conduct of a literature search and user survey to determine user requirements for a top-level style guide. Included in this survey was an assessment of how the *Style Guide* should relate to emerging service and domain-specific style guides.
- Detailed review of the current version of the *Style Guide*.
- Comparison of the *Style Guide* to the emerging *User Interface Specifications for the Defense Information Infrastructure (DII)* (15) to identify complementary and overlapping information.
- Exploration of the potential relationship of the *Style Guide* to the emerging Common Desktop Environment (CDE) style guide and the evaluation of the use of the *Style Guide*, in whole or part, for the CDE.

### 2.3.4 Results

**2.3.4.1 Literature and User Survey** - Preparation of the user survey consisted of two parts. First, a brief literature survey was conducted to assess recent research findings concerning the use and construction of style guides in user-interface development. Second, a user survey was constructed and distributed.

The literature reviewed not only suggested some major attributes for style guides that can lead to the development of usable and consistent interfaces, but it also discussed some criticisms of most style guides in use today. These criticisms are important for the future development of the *Style Guide* because they impact the *TAFIM*'s desire to field open, consistent, and usable

interfaces. User interface openness may be defined as a user interface in which a user will be able to successfully use an application with minimal training, regardless of the hardware/software platform used.

Criticisms of most style guides or design guideline documents for developing user interfaces contained in the literature is that they:

- do little to ensure task consistency
- are not well suited for use during development
- are too general
- limit creativity.

In general, the current generation of style guides focuses on principles of development and the appearance of user-interface objects or widgets, and their expected behavior. They do little to guide the designer/programmer in using these components to create the application interface. These criticisms have been applied to some of the more well known guidelines including the Smith and Mosier guidelines (4), OSF/Motif guidelines (3), the Microsoft® Windows™ guidelines (2), and the Apple Macintosh guidelines (1). Application user interfaces developed using these guidance documents may comply with all aspects of these guidelines, but may be very different and difficult to use.

An alternative recommended in the literature is the development of domain-specific style guides that combine a detailed analysis of the user's information needs for the domain with the guidance contained in the commercially available user-interface style guides. This focus on how information is used and the work activities in the workplace enables the guidelines developer to specify classes of appropriate interface elements and to provide guidelines on how to use these in an application design. These specifications, used together with commercially available style guides such as OSF/Motif (3), permit the development of more consistent and usable interfaces.

Attributes that may affect the content or form of a style guide were also briefly reviewed. The most common elements are listed below:

- Aid or support human factors methods to ensure that the developed user interface matches the end users' tasks.
- Put the tool on-line to work with existing development tools.
- Provide examples—both good and bad.
- Provide design rationales, rules, guidelines, principles, requirements, and user profiles.

Attributes considered necessary for successful style guides were listed and used in drafting survey questions. These attributes resulted in ten statements concerning the type of information that should be contained in a user-interface style guide. Survey respondents were asked to indicate their agreement with the statements using a 5-point scale. In addition to these statements on style guide content, survey respondents were asked to identify the users of the style guide and were given an opportunity to identify style guide features that were not contained in the survey questions. Respondents who had used the *Style Guide* were asked four additional questions about the existing *Style Guide*. These questions focused on the role of the *Style Guide*, its relationship with other style guides, the correct delivery media, and the target audience for the *Style Guide*. The survey is provided as Attachment 2 to this report.

The survey was distributed to a number of people involved in developing the user-interface or user-interface guidelines in the DoD environment. Seven surveys were returned. Figure 3 contains data from the 10 statements concerning attributes necessary for a style guide.

The data from the survey can generally be clustered into three groups. The attribute considered necessary by all survey respondents was graphics to illustrate design principles. For the next group of attributes, the survey indicated that participants strongly agree that the attributes are necessary for a style guide. The average scores for these attributes range from 4.0 to 4.4 and include the following:

- human factors principles to support selection of design alternatives
- domain-specific examples
- style guide information integrated into the development environment
- feedback mechanism to evaluate compliance with the style guide.

The data for the last grouping of attributes ranged from 3.3 to 3.6, indicating there was no agreement on the need for the following attributes:

- recommended design methodologies to guide the design process
- style guide should be on-line
- design rules rather than detailed design guidance
- dynamic examples to improve the application of guidelines.

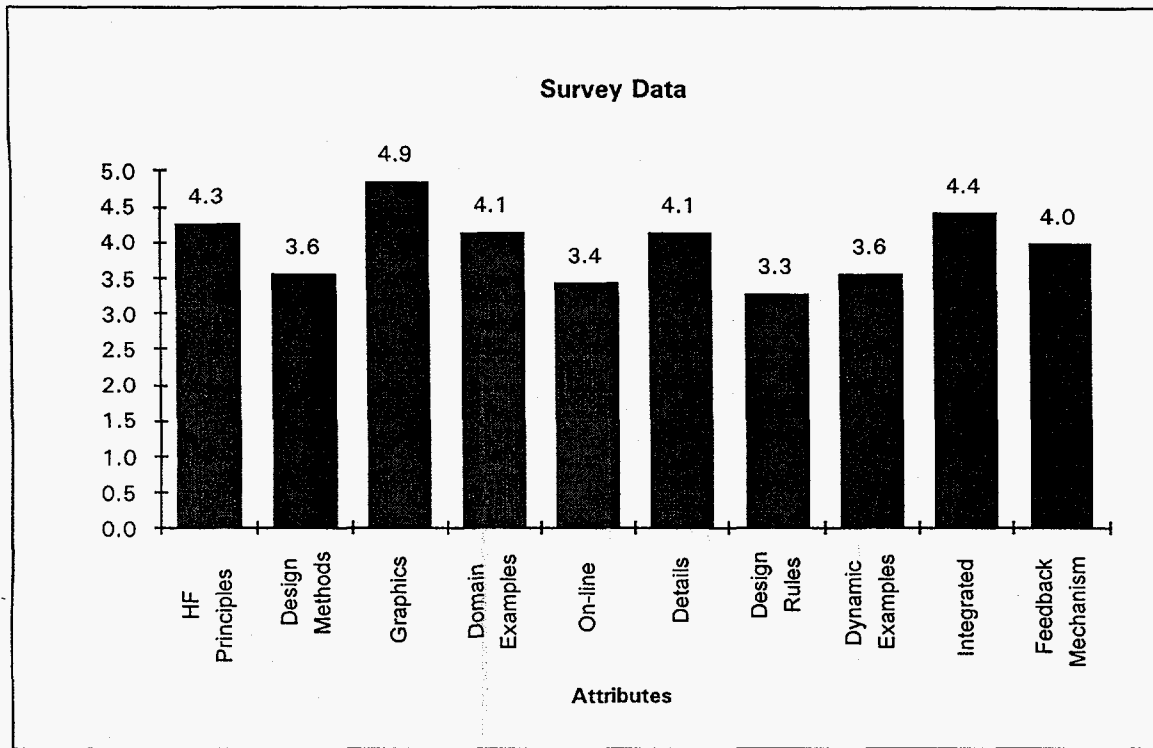


Figure 3. Survey Data

An interesting finding in the survey is the difference in scores on the items concerned with delivering the guidelines on-line (3.4) and that item concerning integrating the guidelines into the programming environment (4.4), which necessarily is on-line. Perhaps the survey respondents thought that more value was added by integrating the guidelines, compared to merely providing access to the guidelines on-line.

In response to the question concerning the principal users of the style guide, there was no consensus. Human factors engineers and user-interface designers each received four votes followed by system engineers and programmers with three votes. Program managers and combat developers/functional proponents each received a vote.



Lastly, the survey gave each respondent an opportunity to suggest features that would contribute to the successful development of a style guide. Items mentioned include:

- a section on usability goals and the importance of establishing quantifiable and measurable goals
- guidance on consistency, integration, ease of use, and preventing human error
- guidance on best practices
- easy-to-use format
- examples—both good and bad
- guidance on cross-platform development
- definition of what an application is composed of or includes.

In the second section, survey questions were more specifically related to the *Style Guide*. The first question concerned the role of the *Style Guide* within the *TAFIM*. Three persons responded to this question. Two thought that it was a document to be used in the development of other style guides. A third person indicated that the *Style Guide* in its current form is misplaced in the *TAFIM* because it does not address the requirements for an open user interface. It was further suggested that, if the *Style Guide* continues to be included as a part of the *TAFIM*, its content should address the style issues that lead to open user interfaces.

A second question concerned the relationship between the *Style Guide* and other DoD style guides. Overall, the *Style Guide* is considered an upper-level document upon which to base the development of domain-specific guidelines. Content for the document includes specification of designs consistent with the native GUIs, options for development tools and methods, and migration paths for user interface to the *TAFIM* target of open interfaces.

A third question concerned the appropriate delivery mechanism for the *Style Guide*. In contrast to the survey question above, where respondents could neither agree or disagree with fielding the *Style Guide* on-line, delivery on-line using the internet was the preferred option. Some also suggested delivering the document on a CD ROM. Other aspects of the on-line delivery include the use of multimedia, hypertext, and graphic illustrations.

The question on the target user for the *Style Guide* yielded the same result as the earlier question for style guides in general. Human factors engineers, system engineers, programmers, and program managers were all mentioned as potential users.

Lastly, the survey concluded with an open-ended question eliciting any other comments. These comments included recommendations to:

- Add a section focusing on user-centered design methods.
- Separate guidance for character-based interfaces from those dealing with the design of GUIs.
- Divide the *Style Guide* into several smaller documents addressing user interface design, human factors, ergonomics, etc.
- Implement the *Style Guide* in a manner that will sustain user interest. Multimedia and interactive examples were cited as characteristics that may contribute to the user's interest.

**2.3.4.2 Review of the Current *Style Guide*** - A detailed review of the most current version of the *Style Guide* was conducted to characterize its content in an effort to better understand the baseline from which the document needs to evolve. A restatement of the purpose of the *Style Guide*, as contained in the document (12), is as follows:

“The purpose of the *DoD HCI Style Guide* is to provide a common framework for HCI design and implementation. Through this framework, the long-term functional goals, objectives, and requirements of the HCI will be defined and documented. Interface implementation options will be standardized, enabling all DoD applications to appear and operate in a reasonably consistent manner.”

This purpose was in support of the *TAFIM* objectives of higher productivity, reduced training time, and reduced development time.

The framework that was developed in the *Style Guide* has been communicated in a document that is principally text and addresses, in different chapters, a comprehensive set of topics associated with the design and development of user interfaces for software applications. The *Style Guide* begins with a discussion of implementation issues associated with graphical user interfaces including the use of commercially available GUIs and their style, the user interface design process, and the use of the *Style Guide*. Other topics include considerations for selection of input and output devices, screen design, windows, menus, direct manipulation, text, and graphics. The design information contained in these chapters has been derived from standards and research in the fields of perception, cognition, human-computer interface, and human factors. The *Style Guide* also contains the available guidance on the development of applications that contain embedded training, query languages, and decision aids and briefly discusses the application of emerging technology in the military environment. Application of the guidelines contained in the *Style Guide* should result in user interfaces that effectively support the ability of the user to perform the application's task and mission.

Review of the *Style Guide* was not only conducted to give a sketch of the contents of the current document, but to assess its ability to contribute to the *TAFIM*'s objective of consistent and open interfaces. The *Style Guide* is a guidance document designed to provide an interface designer with a set of human-computer interface design guidelines. As such, it provides information that will lead to the development of user interfaces that are consistent with the user's ability to perceive and process the information presented and effectively manipulate the screen objects to produce the desired outcome. The guidelines contained in the *Style Guide* are based on accepted behavioral research and present discussions of the factors that lead to good design as design rules. The *Style Guide* is comprehensive, has an excellent research basis, and is applicable to a variety of design situations.

Whereas the *Style Guide* is an excellent source of information for the user interface designer, it may contribute less well to the *TAFIM*'s goal of consistent and open user interfaces across the DoD. The literature suggests that the *Style Guide* is too general to ensure that the user interfaces are consistent from application to application. This evaluation draws the same conclusion. The *Style Guide* contains very few specifics and little or no information concerning the DoD task domain or task environment. Principally, the *Style Guide* is a collection of design guidelines, presented textually, which the user interface designer is expected to interpret for each application. The size of the document, its user-centered perspective, the specificity of the guidance, and the lack of domain-specific examples make the interpretation of the guidelines a difficult task for most of the development community who are not trained in human factors. These factors suggest that, even though the importance of consistency within and among applications is stressed throughout the document, it will be difficult to achieve using the *Style Guide*. Without ensuring consistency in the user interfaces among DoD applications, the *TAFIM* goal of open systems may not be attained.

Because the *Style Guide* is not the only user interface guidance document that developers in the DoD environment must use, it was necessary to compare its content to that of other style guides that may be used in this environment. The *User Interface Specifications for the DII* (the *DII Specifications*) (15) and the *TriTeal Enterprise Desktop (TED™) Style Guide and Certification Checklist* (5) were reviewed to better understand the guidance each may offer in achieving the goal of consistent and open interfaces.

**2.3.4.3 Comparison of the *Style Guide* to the Emerging User Interface Specifications for the Defense Information Infrastructure (DII)** - The *DII Specifications* is a domain-specific style guide prepared for the development of Defense Information Infrastructure software applications. The *DII Specifications* addresses systems in the command and control, intelligence, and combat support domains. It is the intent of the DII to create software systems composed of software components selected from a software repository and configured to meet the needs of the operational community. The goal of the

*DII Specifications* is to provide the software components in the software repository with a common appearance and behavior in a manner that users can interact effectively software systems fielded in the operational environment.

The *DII Specifications* was developed as an extension of the *Style Guide* and complies with its guidelines. The role of the *Style Guide* in the development of the *DII Specifications* was to provide the overarching guidance for development of this more specific set of style guidance. A summary comparing the content of the two documents is contained in Table 1.

The purpose of the *DII Specifications* is to provide the look and feel of individual elements of the user interface, as well as the design of applications and systems for the DII. Because both documents address the development of user interface for military applications, guidelines covering many topics included in the *Style Guide* are contained in the DII document. The DII document has sections on input devices, user-computer interaction, windows and icons, menus, controls, system and application design, application window design, dialog windows, information presentation, task-specific window design, and user support such as on-line help.

It appears from a list of the contents that there is a great deal of redundancy in the documents; however, the two style guides are more different than they are alike. The DII is a much more detailed document, focusing on the specification of the appearance and behavior of individual components of the interface when compared to the *Style Guide*. The *DII Specifications* begins with the assumption that the application will be fielded using either the Microsoft® Windows™ or the OSF/Motif user-interface style. In each of its sections, terms are defined, the look of the interface components is described, and the behavior of the interface components is specified. Separate descriptions are provided for the Windows™ and Motif environments. While the *Style Guide* addresses attributes of the user interface that would lead to ease of use and compatibility with human capabilities and relies on other guidance to define specific interface component look and feel, the *DII Specifications* provides detailed descriptions for the user interface developer. These detailed descriptions should lead to consistency in the operation of individual interface components for applications fielded in the DII environment.

The interface components are well described in the *DII Specifications*, but there is little specificity concerning how these components should be combined to create an application and no guidance concerning the information requirements for DII tasks or the task environment. Unfortunately, the information contained in the *DII Specifications* may be too general and permit too much interpretation to result in the development of consistent applications or software components for the DII. As a consequence, the value of the *DII Specifications*, like that of the *Style Guide*, to contribute to TAFIM objectives for openness and consistency is suspect.

**2.3.4.4 Relationship of the *Style Guide* to emerging Common Desktop Environment (CDE) -** The *TriTeal Enterprise Desktop (TED™) Style Guide and Certification Checklist (5)* provide the specification for the Common Desktop Environment (CDE) application-level certification. CDE, as defined in TED, consists of the OSF/Motif Version 1.2 requirements with CDE-specific additions. The CDE is a graphical user interface for UNIX™ which is intended to bring ease of use to this operating environment. One of the stated advantages of CDE is that it provides as much consistency as possible with the Microsoft® Windows™ and IBM OS/2™ environments.

The content of the *TED™ Style Guide* is more similar to the *DII Specifications* than the *Style Guide*. A summary of its contents is contained in Table 1. Major chapters in the *TED™ Style Guide* include: Input, Navigation, Selection, and Activation; Drag and Drop; Visual Design; Window and Session Control; Application Design Principles; Common Dialogs; Application Messages; and Designing for Accessibility. In each of these chapters, interface objects or components are defined, their look is described and illustrated, and their actions for a variety of situations are described. The *TED™ Style Guide* states how the interface objects should look and feel, and how they should be combined to create the CDE. In addition to the look-and-feel guidance, the authors of this style guide have provided some rationale for the design decisions that have been made. The emphasis of the *TED™ Style Guide* is on the interface object appearance and behavior. The final chapter in this style guide offers both discussion and guidelines for developing interfaces for users who may be physically handicapped. Adherence to the *TED™ Style Guide* and its checklist should permit consistent development of a desktop environment that should contribute to openness in the UNIX™ environment.

The information contained in the *TED™ Style Guide* is closer in content to the *DII Specifications* than it is to the *Style Guide*. In both of the former documents, the focus is on specification of the look and feel of the user interface components. The appearance, the actions that the user can take on the object, and the expected behavior are specified in each of these documents. The *TED™ Style Guide*, however, goes one step further than the *DII Specifications*, in that it specifies how the interface objects should be combined to create a desktop environment from which applications can be run. This additional specification on top of the OSF/Motif definition of the look and behavior of its interface objects permits the designer to develop desktop environments that are consistent among applications and software systems. The relationship between the *TED™ Style Guide* and the *Style Guide* is similar to its relationship to the *DII*. The *Style Guide* can provide the overarching principles and guidelines that will lead to applications that are consistent with the user's capabilities and limitations. The *Style Guide* contains the information that will permit standardization of user interfaces in terms of information presentation and user interaction principles as derived from behavioral research. Commercially available style guides such as those produced by OSF/Motif can provide the specification of the appearance and behavior of interface components or objects. The *TED™ Style Guide* provides guidelines on how to combine interface objects to create a desktop environment. Each has a role in developing consistent and open interfaces.

Topic	DoD	DII	CDE	Comments
<b>Windows™</b>				
-components	Yes	Yes	Yes	
-look	Yes <sup>1</sup>	Yes	Yes	1. Assumes that a commercial GUI style guide will be used.
-behavior	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes	1. Design principles 2. Specified
-controls	Yes	Yes	Yes	
<b>Menus</b>				
-types defined	Yes	Yes	Yes	
-format	Yes <sup>1</sup>	Yes	Yes <sup>2</sup>	1. Design principles 2. Assumes CDE
-contents	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>2</sup>	1. DoD provides general guidance for menu contents 2. DII, CDE define content requirements for some menus
-design rules	Yes	Yes	Yes	
<b>Controls</b>				
-pushbuttons	No	Yes	Yes	
-radio buttons	No	Yes	Yes	
-check buttons	No	Yes	Yes	
-list boxes	No	Yes	Yes	
-scroll bars	No	Yes	Yes	
-combination controls	No	Yes	Yes	
-scales and gauges	No	Yes	Yes	
-function keys	Yes	No	Yes	
<b>Application/Screen Design</b>				
-general principles	Yes	No	No	
-DII Implementation	No <sup>1</sup>	Yes	No	1. Refers reader to GUI specific style guides
-access control	Yes	Yes <sup>1</sup>	No	Refers to DoD <i>Style Guide</i>
-information display	Yes	No	No	
-window controls, location	No <sup>1</sup>	Yes	Yes	1. Assumes commercial GUI style guide
-dialog window type	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	1. More specific than DoD <i>Style Guide</i>
-control arrangement	Yes	Yes	Yes	
<b>Text Information</b>	Yes <sup>1</sup>	Yes <sup>2</sup>	No	1. Principles 2. Specific Guidance
Graphics(Business)	Yes <sup>1</sup>	Yes*	No	1. Types defined
On-Line Help	Yes <sup>1</sup>	Yes <sup>2</sup>		1. Principles 2. Look, Behavior
Maps	Yes <sup>1</sup>	Yes <sup>2</sup>		1. General guidance 2. Specifics for DII
Color	Yes <sup>1</sup>	Yes	Yes	1. More detailed treatment
Decision Aids	Yes	No	No	
Embedded Training	Yes	No	No	
Query Language	Yes	No	No	
Required Applications	No	Yes	No	
Internationalization	No	Yes		
Icons	Yes <sup>1</sup>	Yes	Yes	1. Design principles
Metaphors	Yes	No	No	

**Table 1** Comparisons of the DoD HCI Style Guide to the User Interface Specification for the DII and the TED™ CDE Style Guide

### 2.3.5 Conclusions

The purpose of this research was to explore future directions for the *Style Guide*. The *Style Guide* has evolved since it was first published as the *Human Factors Design Guidelines for the ATCCS Soldier-Machine Interface, Version 1.0* (6) in both format and content. Because it is now a part of Volume 8 of the *TAFIM* (12), its purpose has changed as well. In the future, the effectiveness of the *Style Guide* will not necessarily be measured against its contribution to creating effective usable interfaces, but against the *TAFIM* goals of creating consistent and open applications across the DoD.

The concept of open systems with respect to user interfaces has not been clearly defined. It is difficult to adequately define how many attributes generally associated with open systems, for example interoperability or platform independence, apply to the user of the system. The optimal solution would be for user interfaces for software application to be transparent. In this situation, the user would need to apply only domain knowledge to successfully use the application. However, today's technology does not permit the development of applications that require no knowledge of computer operations. Therefore, open systems for user interfaces have been defined as the ability of the user to move from application to application and platform to platform with minimal requirements for additional training in operating the computer. Open user interfaces will result from consistency in developing user interfaces across applications and platforms. Consistent user interfaces will ensure that similar functions require similar actions from the user, regardless of the application or development environment.

The *Style Guide* in its current form, while addressing goodness of design, is limited in its ability to ensure that the *TAFIM* goal of open user interfaces is realized. Unfortunately, neither the *DII Specifications* (15) or the *TED™ Style Guide* (5) reviewed during the conduct of this project may contribute much to the *TAFIM* goal of open user interfaces. Each of the documents reviewed provides pieces of the necessary guidance: the *Style Guide* provides guidelines and standards based on human factors research in a variety of areas; the *DII Specifications* provides a specific implementation of Motif and Microsoft® Windows™ interface components for DII applications; and the *TED™ Style Guide* provides a specification for creating a common desktop in an OSF/Motif graphical user interface environment. None of these documents provides the specificity required to produce consistent interfaces in a task domain. Each permits broad interpretation of the guidelines and offers little guidance in how interface elements should be combined during the design of the application content.

## 2.3.6 Recommendations

**2.3.6.1 General Recommendations.** The brief literature review that was conducted and the survey data offer direction for developing guidelines documents that can lead to the goal of consistent user interfaces. The principle criticism of style guides offered in the literature is that they are too general and, as a consequence, do not ensure the development of consistent or usable interfaces. It is not uncommon for interfaces that are compliant with a guidelines document to be neither consistent nor usable.

To compensate for this deficiency, the literature recommends that domain-specific style guides be developed, based on a rigorous analysis of the information requirements and work activities. Domain-specific style guides begin with the definition of interface objects as primitives and then use the domain analysis to create higher order interface elements that satisfy domain functions. These higher order interface elements are then combined to create an application. By focusing on the tasks that must be performed and information requirements and by specifying how interface objects should be combined in the user interface to create a function for an application, a higher level of consistency can be obtained across applications developed for a particular domain. Because a domain-specific style guide is based on a user-centered analysis that evaluates the user's tasks and information requirements, the functions and applications developed using the guide should better meet the needs of the user. In this context, the *Style Guide* could be used to specify the design process, design goals, and display standards that would contribute to the development of open systems across the DoD. One example may be to define the subset of interface objects or primitives that may be used in developing a user interface. The commercially available style guides for GUIs or the CDE specification could be used to define the look and behavior of the user-interface objects. Finally, domain-specific style guides, such as the *DII Specifications*, based on an in-depth domain analysis, could be developed to specify higher order interface elements that could be used to build user interfaces for software applications in the domain.

Another criticism from the literature is that the use of style guides is not consistent with the application development process. Attempts should be made to better align the information in the *Style Guide* and its presentation with the design process. The survey data indicates that perhaps the integration of the *Style Guide* information into the development process may be desirable. Delivery of this information on-line using the internet or similar facilities has also been recommended.

Lastly, the use of examples has been recommended as a way to make the information contained in the *Style Guide* more useful and effective. It has been suggested that these examples take advantage of the graphics and interactive capabilities that are currently available, and illustrate both good and bad design solutions.



If consistent and open interfaces are to be developed for the DoD environment, style guides based on an analysis of the information requirements and tasks in the domain should be developed. These style guides should comprehend human factors guidance with respect to information display and human-computer interaction, and must comply with the interface styles available for the commercially available user-interface development environments.

**2.3.6.2 Recommendations for Future Development of the *Style Guide*.** If the *Style Guide* is going to support the TAFIM goals of providing guidance that will lead to consistent and open user interfaces, it will be necessary to significantly modify its content. For the design of consistent and open user interfaces, the *Style Guide* should become much more specific to applications expected in the DoD and less affected by the user interface designers' interpretations. The following is recommended to better harmonize the *Style Guide* with the goals of the TAFIM:

- Operationally define the concept of open systems with respect to user interfaces in the DoD.
- Identify and describe an application design process that will result in the design of consistent, open user interfaces.
- Design and deliver a *Style Guide* that is consistent with the user interface designer's information needs in the development process. Consideration should be given to integrating the *Style Guide* into the development environment.
- Provide a set of more tailored user interface design principles from which the usability and consistency of the application may be evaluated.
- Conduct an analysis of the common elements of information systems across the DoD. This may be the set of support applications that are shared among the operational domains. Use this information to establish the specification of the look and feel of applications in the military.
- Conduct an analysis of the commercially available GUI style guides. The GUIs for Microsoft® Windows™ and Windows® 95, OSF/Motif, and user interface styles should be included as a minimum. The functions, look, and feel of each of the interface objects should be described and compared to the functional requirements for military applications as determined in the prior task. The application of specifications for the CDE may also be considered in this analysis. Select a subset of the interface elements that delivers the required functionality in the most consistent manner across the interface environments. Specify these as the set of interface elements that may be used in a DoD application design.

- Provide valid graphic examples to guide the user interface designer.
- Minimize the redundancy between the information contained in the *Style Guide* and the commercially available and domain style guides.

Developing a style guide that will lead to consistent user interfaces for DoD applications will not be an easy task. It will require a significant amount of research to determine the content, form, and method of delivering the information in the *Style Guide* to the developer. Realization of the *TAFIM's* goal of consistent and open interfaces will also require the development of domain-specific style guides that are built from an in-depth analysis of the user's specialized needs in the operational environment, together with the information contained in a newly formed Style Guide.

### 3.0 SUMMARY

PNNL successfully completed the three tasks contained in this year's tasking. Results of these tasks are summarized below.

- **Task 1** - This task provided DISA with an updated set of design checklists that can be used to measure compliance with the *Style Guide*. These checklists now reflect the most current version of the *Style Guide* and are in Microsoft® Word 6.0 format.
- **Task 2** - This task provided a discussion of two basic models for using the *Style Guide* and the *Design Checklist* —as a compliance tool and as a design tool. In addition, methods for delivering the *Style Guide* and *Design Checklist* are discussed. Preliminary results indicate that various methods to distribute electronic style guides and checklists are all feasible, depending on the available computing technology. More important is the issue of *how* to use and implement the style guides and checklists more effectively through the use of computerization.
- **Task 3** - This task investigated future directions for the *Style Guide*. The task focused on the changes that should be made in the *Style Guide* to more effectively assist DoD in reaching the TAFIM's goal of supplying open systems in the military environment. Literature review, user surveys, and review of the content of the *Style Guide*, the *DII User Interface Specification*, and the *TED™ Style Guide* were used to suggest future directions for the *Style Guide*.

This page intentionally left blank.

## 4.0 RECOMMENDATIONS

PNNL has three major recommendations for future efforts with the *Style Guide*, as follows:

- The *Design Checklist* should be included as an attachment to Volume 8 of the *TAFIM*, for improved availability to the community.
- A study should be performed that continues to explore the methods to automate the *Style Guide* and *Design Checklists*. In addition, prototypes should accompany the study to support the concept of automation and support *how* the *Design Checklist* is to be used according to the strategies described in Section 2.2.1.
- The *Style Guide* should undergo a significant revision during FY97. This revision should be targeted towards better consistency with the goals of the *TAFIM*, providing better design process guidance for how one develops HCIs for open systems, and updating design guidelines where appropriate. The *Style Guide* revision should include an operational definition of open systems with respect to the user interface, a small set of user interface design principles, the specification of acceptable user interface elements, and valid examples to guide design. The *Style Guide* revision should be based on an analysis of information systems' needs across the DoD.

This page intentionally left blank.

**Attachment 1 to Final Report FY96 DISA Tasks**

**DoD TECHNICAL ARCHITECTURE FRAMEWORK  
FOR INFORMATION MANAGEMENT (TAFIM), VOLUME 8**

*U.S. Department of Defense  
Human-Computer Interface Style Guide*

***HUMAN-COMPUTER INTERFACE  
STYLE GUIDE DESIGN CHECKLIST***

This page intentionally left blank.



# ***DESIGN CHECKLIST***

for

**DoD TECHNICAL ARCHITECTURE FRAMEWORK  
FOR INFORMATION MANAGEMENT (TAFIM), Version 3.0**

**VOLUME 8**

***U.S. Department of Defense***

***Human-Computer Interface Style Guide***

30 September 1996

Prepared by  
Pacific Northwest National Laboratory  
Operated for the U.S. Department of Energy  
by Battelle

for

U.S. Department of Defense  
Defense Information Systems Agency (DISA)  
Center for Standards (CFS)

## DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

*PACIFIC NORTHWEST NATIONAL LABORATORY*  
*operated by*  
*BATTELLE*  
*for the*  
*UNITED STATES DEPARTMENT OF ENERGY*  
*under Contract DE-AC06-76RLO 1830*

## CONTENTS

INTRODUCTION.....	1
Background.....	1
Purpose .....	2
Assumptions.....	2
USING THE DESIGN CHECKLIST.....	3
Description of the Design Checklist .....	3
Customizing the Design Checklist.....	4
Preparing for the Evaluation.....	4
Applying the Design Checklist.....	4
Responsibilities of the Organization with Oversight on the Application Being Reviewed .....	5
Responsibilities of Checklist User on Application Being Reviewed.....	5
 DESIGN CHECKLIST:	
Chapter 4 - Screen Design.....	4-1
Chapter 5 - Windows.....	5-1
Chapter 6 - Menu Design.....	6-1
Chapter 7 - Direct Manipulation.....	7-1
Chapter 8 - Common Features.....	8-1
Chapter 9 - Text.....	9-1
Chapter 10 - Graphics.....	10-1
Chapter 11 - Decision Aids.....	11-1
Chapter 12 - Query .....	12-1
Chapter 13 - Embedded Training.....	13-1

This page intentionally left blank.

## INTRODUCTION

### BACKGROUND

The proliferation of computer technology has resulted in the development of numerous computer-based systems and the implementation of varying styles of the Human-Computer Interface (HCI). To accommodate the expected growth in computer-based systems, minimize HCI diversity, and improve system performance and reliability, the U.S. Department of Defense (DoD) is adopting software development standards and providing guidelines for information display and manipulation. These DoD policy standards and guidelines have been compiled into the DoD *Technical Architecture Framework for Information Management (TAFIM)*. Volume 8 of the TAFIM, the *DoD HCI Style Guide*, addresses HCI issues.

Standardization of the HCI is based on selection of a Graphical User Interface (GUI), which in turn provides a standard Application Programming Interface (API) and style approach. The GUI is determined by the software source selected, such as Commercial-Off-the-Shelf Software (COTS), Government-Off-the-Shelf Software (GOTS), or proprietary software applications. The variability of users' needs and differing interpretations of GUI style result in lack of a common approach and creation of dissimilar HCIs among applications developed by independent organizations. Adding to the problems in standardization is the fact that most of these software packages do not address several issues common to DoD systems, for example, map graphics operations. The *DoD HCI Style Guide* is the bridge to address these issues as well as to provide high-level guidance for designing consistent and more standard HCIs within DoD.

This *Design Checklist* is abstracted from the *DoD HCI Style Guide* contained in Version 3.0 of the TAFIM. The *Design Checklist* is designed to help provide a human factors review of the emerging software applications. This checklist is

expected to serve as a formal template for the human factors review of an HCI and should be used by human factors specialists to assess the design features. Selecting questions from the *Design Checklist* for a particular review is dependent on the objectives, issues, and questions chosen for the evaluation, as well as the specific design of the HCI.

## **PURPOSE**

The purpose of this guide is to provide instructions for the *Design Checklist*. A human factors specialist will normally use this checklist at the system equipment where the application resides. The *Design Checklist* contains questions applying to Chapters 4.0 through 13.0 of the *DoD HCI Style Guide 3.0*. The decision to use all or a part of the *Design Checklist* during a specific review is dictated by the specific design of the system or application.

## **ASSUMPTIONS**

Certain assumptions have been made in designing these checklists. These assumptions are that a checklist user will have the following:

- basic knowledge of human factors
- basic knowledge of the Style Guide
- familiarity with the application system mission and use
- familiarity with background of the typical user.

## USING THE *DESIGN CHECKLIST*

### DESCRIPTION OF THE DESIGN CHECKLIST

The *Design Checklist* contains a complete list of questions -- one question for each guideline, correlated and numbered according to all of the design guidelines in only Sections 4 through 13 of the *Style Guide*. Sections 1 through 3 of the *Style Guide* are primarily introductory material; Section 14 applies to emerging, new technologies.

The *Design Checklist* is organized in table format by section (chapter) and subsection number and title, and includes columns for the guideline, Mandatory/Recommended (M/R), Yes/No (Y/N), Not Applicable (N/A), and Comments. These are briefly described below.

- The section and subsection headings with gray backgrounds indicate topics with further subdivisions.
- The "section/subsection number" for each guideline question corresponds to the location of the applicable guideline in the *Style Guide*. Where there is no number directly associated with a guideline column statement, the statement has been drawn from a larger paragraph whose number has been cited previously.
- The "guideline column" contains the checklist question for the associated section/subsection reference.
- The "M/R" column indicates whether meeting each specific guideline criterion is mandatory or recommended as defined by the personnel performing the human factors design review.
- The "Y/N" column indicates whether the application design meets or does not meet the criterion described.

- The "N/A" column indicates when the criterion is not applicable, as it does not apply to the application design.
- The "Comments" column is provided for entry of comment information relating to compliance with each criterion.

### **CUSTOMIZING THE *DESIGN CHECKLIST***

To conduct an assessment, use all appropriate chapters of the *Design Checklist*. Use the entire checklist as a whole, or use only a particular chapter or any set of individual questions. Sections that do not apply to certain applications may be omitted, or particular questions may be marked N/A for "not applicable." Reasons for not using sections, subsections, and questions should be documented.

### **PREPARING FOR THE EVALUATION**

The *Design Checklist* user should select questions, in part, based on the maturity of the application being tested. Because compliance will most often be determined through observation of the subject application, the *Design Checklist* user should coordinate as necessary to achieve direct observation. The *Design Checklist* questions establish the criteria for the assessment. Note that some questions are directed toward the process of development, while others focus on the end product interface.

### **APPLYING THE DESIGN CHECKLIST**

It is intended that the *Design Checklist* be completed by the organization with oversight on the application being reviewed and the checklist user, with both parties making entries. The organization with oversight responsibility can



determine, with input from the checklist user, whether the criterion should be mandatory or recommended for the application being reviewed. Mandatory style issues become part of the specification for the specific application or family of applications.

### **Responsibilities of the Organization with Oversight on the Application Being Reviewed**

- “M/R” Column entries for each question:
  - Enter “M” if the criterion for each question is mandatory.
  - Enter “R” if the criterion for each question is recommended.

### **Responsibilities of Design Checklist User on Application Being Reviewed**

Responsibilities include “Y/N,” “N/A,” and “Comments” boxes entries for each question.

- “Y/N” entries:
  - Enter “Y” if “Yes”—the application design meets the criterion described by the guideline question.
  - Enter “N” if “No”—the application only partially or completely does not meet the criterion described.
- “N/A” entries:
  - Check “N/A” box if the criterion does not apply to the application design.
  - Check “N/A” box as appropriate during Customizing the *Design Checklist* and/or Preparing for the Evaluation phases to indicate applicable question selection.

- "Comments" entries:
  - Enter an appropriate comment when the "Y/N" box entry is "N" for "No." The comment should briefly note the problem causing the application design to partially or completely not meet the criterion.
  - Enter any other comment as needed for each question, to qualify or expand an answer.

### Chapter 4 - Screen Design

M/R - Mandatory/Recommended

Y/N - Yes/No

N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>4.1 INITIAL SCREEN DESIGN FOR ACCESS-CONTROLLED WORKSTATIONS</b>					
<b>4.1.1 Workstation Log-On</b>					
	Does each workstation have a standard log-on screen for each system?				
	Does each workstation have a SCREEN SAVER that: - Activates after being idle for 5 minutes? - Deactivates when new activity is initiated? - Allows user to set activation time to less than 5 minutes, if appropriate?				
	When required and before gaining access to system resources, does the security authentication information/ identification consist of a combination of name, password, and/or other identification information?				
	Are log-on prompts (e.g., name, password, etc.) clearly labeled and displayed on separate lines?				
	Are error messages clearly displayed on screen together with guidance on correcting the error?				
	Do error or help messages exclude information that could assist in breaking into the system?				
	Is the system-high banner displayed for workstations accredited for system-high operations?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the system-high banner displayed in the color appropriate to the security level?				
<b>4.1.2 Application Log-On</b>					
	When unitary log-on is <i>not</i> supported for a secure system, is an additional/ or separate log-on required for authentication before allowing access to applications?				
<b>4.1.3 Application Log-Off</b>					
	Is application log-off performed by the Exit function?				
	Does the application, when logging off, require the user to confirm the quit, save modified data, or cancel the quit request?				
	Does application log-off exit the application and close all associated windows?				
<b>4.1.4 Workstation Log-Off</b>					
	Does workstation log-off end all sessions, close all application windows, and return to the initial log-on screen?				
	Does workstation log-off require user confirmation by selecting the log-off option from the resource manager window?				
<b>4.1.5 Initial Workstation Screen Display</b>					
	Does the initial workstation screen display give the user access only to allowed system resources?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is access achieved by menus, icons, or interface structures, such as icon/tool bars?				
	Are resource management functions easily available to the user with a minimum of required keystrokes?				
4.1.5.1	Are availability and display of resource capabilities determined by task requirements of the user?				
	Does the resource manager present only those functions or applications to which the user is allowed access?				
4.1.5.2	Does the resource management interface provide, as a minimum, easy access to applications the user is authorized to use, e.g., menus and/or icon/tool bar interfaces below status display?				
<b>4.1.6 Classification Color Selection</b>					
	Have military intelligence communities used/followed the required classification color selections?				
<b>4.2 SCREEN DESIGN GUIDELINES -- General</b>					
<b>4.2.1 Visual Design</b>					
	Does the visual screen design encourage work flow, and is it visually pleasing to the user and easy to use?				
4.2.1.1	Are display formats/features always created with a consistent structure?				
4.2.1.2	Are fields (e.g., data element names, group captions/titles, or window titles) located consistently, and do they remain the same for each presentation?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
4.2.1.3	Are all the elements in a display distinctive?				
	Is visual competition minimized among information items on the display?				
	Do contrasting features (e.g., inverse video and color) call attention to screen components and urgent items?				
	Are screen elements arranged so they are visually, conceptually, and linguistically clear and understandable?				
4.2.1.4	Does the order of data on the display follow a principle that the user can recognize and apply?				
	Does each display have a descriptive title/header at the top of the page with at least one blank line between the title and the body of the display?				
	Does each display have a consistently located message area (e.g., status and error messages, prompts, and command entry)?				
	Is text display screen density (i.e., ratio of characters to blank spaces) less than 60%?				
	Is data density density (i.e., ratio of data characters to total display space) less than 30% of total screen or window?				
	Are screen usage instructions located at the top of the text, preceding response options?				
	Are disposition instructions for a completed screen or window located at the bottom?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are functional fields assigned for specific types of data (e.g., error/system messages, alarms) and consistently located in the screen or window?				
4.2.1.5	When data/terms are critical, important, require immediate response, or are frequently displayed, are they grouped in the user's primary viewing area?				
4.2.1.6	Are data arranged/grouped on displays to differentiate among instructions/data and facilitate observation of similarities, differences, and trends?				
4.2.1.7	Are elements grouped cohesively, using blank space, surrounding lines, intensity levels, etc.?				
4.2.1.8	To attract user attention appropriately, have the following VISUAL APPROACHES been used:				
	- Is intensity limited to a maximum of two levels?				
	- Is marking used, e.g., underline, arrows, bullet, dash, asterisk?				
	- Are sizes limited to a maximum of four?				
	- Are blinking rates in 2 to 4 hertz range?				
	- Is the number of fonts limited to three or less?				
	- Is inverse video (coloring) used?				
4.2.1.9	- Are no more than four standard colors used?				
	Did the screen design process include user feedback, e.g., of prototypes, sample screens, or opinion samples?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>4.2.2 Functional Screen Design</b>					
	Does the interface present an obvious and predictable work flow that is effiecent for the user?				
	Is the interface as simple as possible and still give the user the funtionality to complete tasks effectively?				
4.2.2.1	Do screen design procedures establish a set of criteria for prioritizing different levels of displayed information?				
	Is critical information always displayed and optional information available by request?				
4.2.2.2	Is text information density minimized (screen/window information density less than 30%) on system displays by presenting only essential/critical information?				
	Is information distinguished from labels, titles, or lines/boxes?				
	Is density of graphic displays minimized by using input from end users as guidance?				
4.2.2.3	When user needs specific data displayed concurrently to judge a time-critical task, is it provided in an integrated display rather than in separate windows?				
4.2.2.4	Is information presented in a directly usable form that does <i>not</i> require the user to decode or interpret data?				
4.2.2.5	When analyzing data sets (e.g., discerning similarities, differences, trends), is the display structured so that data are grouped consistently?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
4.2.2.6	When displayed data occur in spatial or temporal order, are data grouped by sequence of use to preserve the order?				
4.2.2.7	Are required key strokes and hand/eye movements minimized?				
4.2.2.8	Does the interface allow easy error correction and recovery while protecting the application from catastrophic user errors?				
4.2.2.9	Is a function trade-off analysis for the system under development being performed to determine the tasks best performed by automation and humans?				
	Does functional screen design assign tasks to the most appropriate resource, either computer or human?				
<b>4.2.3 Screen Design Standards, Guidelines, and Requirements</b>					
4.2.3.1	Are abbreviations used appropriately and consistently?				
	Is an abbreviation key or built-in reference table provided?				
	Do abbreviations conform to standards?				
	Does the domain-level style guide cite the domain-selected standard for abbreviations?				
	Are periods avoided after abbreviations?				
	Is an on-line spell-checker provided that addresses abbreviations and acronyms for applications requiring extensive text input?				
	Are short, simple sentences used in text?				
4.2.3.2	Are large portions of text broken into smaller, meaningful groups?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
	Is blank space used to structure a display?				
	Are two columns used to improve readability of screens containing large amounts of text?				
	Are labels located close to related data fields and separated by at least one space?				
	Is spacing sufficient between words, lines, and paragraphs?				
	Are series of data presented in vertical ( <i>not</i> horizontal) column format?				
	Is the starting point obvious?				
	Are alphanumeric columns left-justified?				
	Are numerical data without decimals right-justified?				
	Are numerical data with decimal points justified by the decimal?				
4.2.3.3	Are 70-character positions used on the standard 80-character line?				
	When displaying text in windows format, do words wrap to prevent excessive scrolling side-to-side?				
	Does text presented in a window have blank space at the start and end of each line to increase readability (e.g. blank space approximately the size of two average text widths)?				
	Are no more than 40 characters displayed on each column line?				
4.2.3.4	Are capital letters used for typographic coding, headlines, new paragraphs, and/or captions and labels -- <i>not</i> in running text or tables?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is spacing sufficient between characters/lines (20 to 50% of character height)?				
	Is the minimum height of displayed characters equal to 1/200 of viewing distance, so that a 36-inch viewing distance will require 0.18-inch character height on the display screen?				
	Is character width 50% to 100% of character height?				
	Is character stroke width a minimum of 10% to 12.5% of character height?				
	Does the maximum text size <i>not</i> exceed 10% of the available vertical display area on a full-size screen?				
	Are characters of a minimum 7 x 9 dot matrix construction?				
	Are characters on the screen legible to a person standing behind the user?				
	Do background color and contrasting foreground (text) color ensure sufficient contrast for good readability?				
	Is font size appropriate to objective hardware?				
4.2.3.5	Is text displayed statically (e.g., <i>not</i> constantly scrolled across the screen)?				
	If text is scanned by constant scrolling, do column lines contain no more than 35 characters?				
4.2.3.6	When no logic exists for grouping data by sequence, frequency, or importance, has another principle been adopted (i.e., alphabetical or chronological)?				
4.2.3.7	When data exceed a single display frame, are data partitioned into separate window panes or pages?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
4.2.3.8	When partitioning multiple page displays, are related items displayed on one page?				
4.2.3.9	In a multipage display, is each page labeled with a unique identifier indicating its relation to the other pages (e.g., page 1 of 5)?				
4.2.3.10	Is the minimum viewing distance from the user's eye to the monitor equal to or greater than 30 centimeters (cm) or 12 inches?				
4.2.3.11	Is the readability of displayed text maximized by limiting character heights to a range of 16 to 24 minutes of visual arc (min)?				
4.2.3.12	Is the input prompt displayed next to the command entry area when command line interfaces are used?				
<b>4.3 COLOR</b>					
<b>4.3.1 Color - General</b>					
4.3.1.1	IS COLOR USED - to assign specific meaning to information?				
	- to direct attention to important/time-critical information?				
	- to facilitate rapid differentiation among types of information?				
	- to increase the amount of information portrayed on a graphic display by adding color as well as shape?				
	- to indicate changes in status of graphical data?				
4.3.1.2	Is color coding added only after effectively designong in an achromatic format?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
	Is only logically related information colored in similar hues?				
	Are colors for more important information brighter than adjacent color-coded information?				
	Is color coding avoided when it could confuse users who have defective color vision or when it would reduce screen readability?				
	When color is used to compare data or discriminate, are yellow and blue, or red and cyan used rather than green, yellow, and red?				
	If green, yellow, and red are used, are other cues such as brightness or saturation also used to improve discriminability?				
	Is color coding redundant to another feature, such as symbology or text content?				
	Is achromatic color (e.g., black or white) used if coding in a small area?				
	Is white highlighting avoided and are status changes indicated by a uniquely colored base/box, adjacent to the text?				
	Is the use of red and black or black and blue avoided?				
	Is contrast high between the text/graphical object and its background, and is a pure white or black background avoided?				
	Is the use of high luminance backgrounds avoided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
<b>4.3.2 Color Selection</b>					
4.3.2.1	Are colors for coding discrete information categories easily distinguishable?				
	Are colors widely spaced along the color spectrum?				
	Are subtle colors (e.g., of low saturation and shorter wavelengths) used for less frequently displayed information?				
	Do warm colors (e.g., longer wavelengths such as red/orange) convey action or the requirement for a response; and do cool colors (e.g., shorter wavelengths such as blue/green) convey status or background information?				
	Does each color represent only one category of data?				
4.3.2.2	Is color applied consistently from screen to screen and application to application (e.g., do <i>not</i> use status colors as window borders unless status coding is intended)?				
	Are color coding of labels and color associations of label text consistent (e.g., red and ENEMY)?				
	Are standard colors, based on conventional associations, chosen for coding?				
4.3.2.3	Is color coding conservative (e.g., relatively few colors designate critical categories of displayed data) and performance-enhancing?				
	Is the number of colors limited (e.g., 4 colors for alphanumeric and 7 total for all screens)?				
	Are only 4 standard colors used, with others reserved for occasional use?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
4.3.2.4	Are colors paired to maximize user performance?				
	Is the use of highly saturated and spectrally extreme color pairs avoided (e.g., red and blue, yellow and purple, magenta and green)?				
	For emphasis in tactical information, are contrasting colors (e.g., red and green or blue and yellow) used in text and presentation graphics displays?				
	To convey similar tactical information in text/presentation graphics, are similar colors (e.g., orange and yellow or blue and violet) used?				
	Is the use of extensive color for background (e.g., many colors) avoided?				
	Is the use of monosaturated primary colors avoided, e.g. red-green or blue-green?				
4.3.2.5	Is color selection suitable to the level of ambient illumination (e.g., yellow for good general visibility over a broad range of luminances while green over an intermediate range, red under high ambient lighting)?				
4.3.2.6	Are specific colors and associated military color coding applied appropriately?				
4.3.2.7	Is blue used appropriately (e.g., as background for tasks performed at close distances; saturated blue for background features, but <i>not</i> for small lines/dots on dark background or critical data)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 4 - Screen Design

Section	Guideline	M/R	Y/N	N/A	Comments
4.3.2.8	Is an easily accessible color-coded key to color meaning provided when deviating from standard color codes and associated meanings?				
	Do colors used in the key have the same appearance as the color being defined?				
4.3.2.9	In a large-scale display, are yellow and blue used rather than red and green for periphery colors?				
4.3.2.10	Do foreground and background colors have high contrast (e.g., black on light blue or blue on white)?				
<b>4.3.3 Tonal Color Coding</b>					
4.3.3.1	When relative rather than absolute values are important, are gradual changes of a single color displayed as a tonal code to indicate relative values of the single variable?				
	Is monochromatic shading displayed rather than spectral codes (different colors)?				
4.3.3.2	When map areas are coded by texture patterns or tonal variation, are assigned values ordered (e.g., darkest and lightest shades for extreme values)?				
<b>4.3.4 Color-Coded Symbols</b>					
4.3.4.1	Is the size of any color-coded object on the screen adequate at the maximum viewing distance (color-coded symbols subtend a minimum of 20 minutes of visual arc)?				
4.3.4.2	Do color-coded symbols have a minimum luminance of one foot-lambert?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 4 - Screen Design**

Section	Guideline	M/R	Y/N	N/A	Comments
4.3.4.3	Does the minimum refresh rate for color-coded symbols ensure that the display is flicker-free?				
<b>4.3.5 Map Graphics and Color</b>					
4.3.5.1	On map graphics displays, does color coding provide specific meaning rather than being decorative only, and is it consistent with appropriate standards?				
4.3.5.2	Are colors selected with respect to human retina focal distances as a result of wavelength?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 4 - Screen Design

This page intentionally left blank.

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

M/R - Mandatory/Recommended

Y/N - Yes/No

N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>5.1 WINDOW BASICS</b>					
<b>5.1.1 Basic Window Appearance</b>					
	Is the window appearance consistent with the selected GUI and commercial style guide?				
5.1.1.1	Does the title clearly identify the application and file?				
	Is the title centered and distinguished by a visual attribute (e.g., boldface type)?				
	Do open windows identify application and window function (e.g., "messages:e-mail") rather than system name?				
	Does the window title display the application version number, if allowed by the GUI?				
	Is the display of any messages avoided in the window title area?				
5.1.1.2	Are window management functions (e.g., close, move, window resizing functions) consistently provided by a button in the upper left corner of the title bar?				
5.1.1.3	Can a base window be iconified?				
5.1.1.4	Are windows expandable to full size in accordance with the selected style "look and feel"?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>5.1.2 Dragging the Window</b>					
	When dragging or moving a window, does a "ghost" outline move with the pointer?				
	Does the window move to the outline position when the procedure is complete (mouse button is released )?				
<b>5.1.3 Scroll Bars</b>					
	Do scroll bars provide the capability to navigate through documents without paging one window at a time?				
<b>5.1.4 Application Area</b>					
	Is the application area clearly and consistently identified to the user?				
<b>5.1.5 Message Area</b>					
	Is the message area reserved for noncritical application messages that do <i>not</i> suspend processing?				
	Is the left side of the message area used for short-term messages and the right side for medium-term messages?				
<b>5.1.6 Resizing the Window</b>					
	Does the application allow window resizing?				
	Does the minimum height of a window allow space for the classification bar, title bar, and menu bar?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the application designed to accommodate the resizing function, and is important information included in the upper left corner of the window?				
	Does window resizing change only the window border size and <i>not</i> size/relative position of the text or objects in the window?				
	Are resizable windows easily distinguishable from those that cannot be resized (e.g., system window)?				
<b>5.1.7 Window Controls</b>					
	Do controls mimic physical items represented (e.g., switches, buttons) by providing feedback before, during, and after selection?				
	Are window controls activated by both mouse and keyboard (e.g., arrow keys for movement between controls, Return/Enter to invoke indicated control, and mnemonics for each control)?				
	Is the control area clearly marked for easy identification when the control background is the same as the area surrounding the control?				
<b>5.1.8 Window Colors/Patterns/Audio Signals</b>					
	Is color always redundant to another visual attribute and <i>not</i> the only visual means of distinction?				
	Do background patterns on color and monochrome displays highlight, group, or clarify relationships and add meaning?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 5 - Windows

Section	Guideline	M/R	Y/N	N/A	Comments
	Are colors used sparingly, and do they match user expectations?				
	Do users have the option to select their own color schemes?				
	Have meanings strongly associated with colors been maintained (e.g., red is used for critical, <i>not</i> noncritical buttons)?				
	Are color and sound both used for messages that require user acknowledgment?				
	Are spectrally extreme colors <i>not</i> displayed together (e.g., red and green)?				
	When data are color-coded, is a legend provided at the bottom of the window?				
	Are color codes limited to 4 per window and 7 per application?				
	Is the same background/foreground color scheme used for all windows of an application?				
	Is text displayed in multiple colors <i>only</i> if the colors provide additional meaning?				
	Is use of white text on black background avoided?				
	Is workspace/computer screen background appropriate to the expected lighting conditions and of a neutral color?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does application window background contrast sufficiently with the foreground and provide a neutral background for the data (e.g., muted pastels)?				
	Are larger objects less saturated/deep in color to avoid eye fatigue?				
	Are background colors avoided that match CMW Classification Bar colors?				
<b>5.2 WINDOW DESIGN</b>					
<b>5.2.1 General Guidance</b>					
5.2.1.1	Is screen size sufficient to support windowing and to avoid frequent manipulation of the screen?				
	Is processing speed sufficient to avoid slow operation of real-time applications performed by the computer?				
	Is screen resolution sufficient to avoid less effective visual coding, especially for graphical interface presentations (e.g., symbols and icons)?				
5.2.1.2	Does the design allow the user to customize window content and format, balancing the use of preformatted and user-specified windows?				
	Can user specify and select separate data windows on one display?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
	When information for decision-making varies, can the user specify information to include in the display?				
	Are preformatted windows provided (e.g., standard message formats)?				
	Can the user concurrently display several preformatted windows?				
5.2.1.3	Are window objects provided (e.g., a menu of alternatives) to add data and information temporarily?				
	Is the temporary window object positioned to minimize obstruction of the active window?				
	Are data that are covered by a temporary window object immediately restored when the object is removed?				
5.2.1.4	Has a maximum allowable number of open windows been defined, commensurate with system performance needs?				
5.2.1.5	Is visual clutter avoided?				
	For tiled window systems, is clutter at the edges minimized (e.g., scroll bars, etc.)?				
	Is background pattern neutral rather than complex?				
	Can more than one line of data be displayed if more than one line must be scanned?				
	Are special-purpose areas (e.g., command entry, messages, and prompts) placed at the bottom of the window display?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
	Do dialog boxes have control buttons located at the bottom with the selected or default (e.g., OK) on the left, "CANCEL" on the right, and any additional buttons in between?				
<b>5.2.2 Window Control</b>					
5.2.2.1	Are control actions (e.g., command entry) consistent from one window to another?				
	Can the user consistently control characteristics of windows (e.g., size, location, and characteristics of superimposed window objects)?				
	Is there an easy means to suppress display of window objects (e.g., iconization or closing)?				
	Are separate menu bars provided for different application windows operating concurrently as open windows?				
5.2.2.2	Is window iconization (e.g., opening, closing) clearly depicted through animation?				
	Do subordinate window and dialog boxes close when the main application window is closed?				
5.2.2.3	Is window movement depicted as either full window movement or movement of an outline with the window visible on-screen?				
	Does the cursor change shape when performing a move function (e.g., resize)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
5.2.2.4	Is the user protected from obscuring critical information (e.g., alerts) when moving or resizing windows?				
	Are window contents visible during resizing?				
	Are all tiled windows automatically resized when a window must be resized?				
	Is the resize border removed when a window size is fixed?				
5.2.2.5	Do data move in the expected manner (e.g., moving the window over the data) when the scroll bar is used?				
	Is the distance indicator on the window scroll bar consistent with the proportion of distance moved through the file?				
	Is scrolling used effectively and efficiently (e.g., excessive screening avoided)?				
	If scrolling is unnecessary, is the scroll bar <i>not</i> displayed?				
<b>5.2.3 Designation</b>					
5.2.3.1	Is the active window clearly indicated?				
5.2.3.2	Is it easy for the user to select/designate the active window?				
<b>5.2.4 Labeling</b>					
5.2.4.1	Are window objects and dialog boxes given appropriate descriptive labels (e.g., messages:e-mail:outbox)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 5 - Windows**

Section	Guideline	M/R	Y/N	N/A	Comments
5.2.4.2	Are menu selections from the supraordinate windows used in labeling subordinate windows?				
5.2.4.3	Are locations of window titles consistent?				
<b>5.2.5 Open Window Navigation</b>					
5.2.5.1	When using an overlapping window structure, can the user request an iconic or text map/indication of all open windows?				
	Can the user easily identify all open, especially hidden, windows?				
5.2.5.2	Can the user designate the active window from the open window map by highlighting the window representation?				
5.2.5.3	Can the user query an open window map to get additional information (e.g., date created, size, description of subject or application) on the file or application operating in the open window?				
5.2.5.4	Can user bring a window forward from the iconic or text map by selecting it without having to resize or move other windows?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 5 - Windows

This page intentionally left blank.

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 6 - Menu Design

M/R - Mandatory/Recommended  
 Y/N - Yes/No  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.1 GENERAL</b>					
<b>6.1.1 Consider Response Time and Display Rate</b>					
	Are response time and display rate considered in menu design (e.g., small number of menu items when display rate is slow, larger number of menu items when response time is long)?				
<b>6.1.2 Instructions and Error Messages</b>					
	Are menu instructions and error messages indented and located consistently on screen throughout the application?				
<b>6.1.3 Explicit Option Display</b>					
	Is a menu of options added to the working display if the set of options is small?				
<b>6.1.4 Stacking Menu Selections</b>					
	Can the user stack commands when menu selection is performed by code entry?				
<b>6.1.5 Menus Distinct From Other Displayed Information</b>					
	Are menu options distinct from other information on the display and located consistently?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.1.6 Menu Bars</b>					
	Are menu bars for system functions located across the top of the display screen or window?				
6.1.6.1	Are menu bars normally used with standard sized screens (12-19 inches)?				
	Are menu bars used primarily when screen size does <i>not</i> negatively affect performance (e.g., pointer travel time is acceptable)?				
	Are large-screen displays (e.g., projections, theater-type displays) intended for multiple viewers?				
6.1.6.2	Are menu bar options constantly visible?				
<b>6.1.7 Pull-Down Menus</b>					
	Are pull-down menus used when pointer position is <i>not</i> important for information/option retrieval?				
<b>6.1.8 Pop-Up Menus</b>					
	Are pop-up menus specific to their areas on the display?				
6.1.8.1	Are pop-up menus connected to pointer location?				
	Are pop-up menus located near the manipulated object or higher-level menu?				
6.1.8.2	Are pop-up menu options selected by moving the pointer and performing an overt clicking action, rather than by releasing a depressed mouse button?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
6.1.8.3	Do selected items remain highlighted?				
<b>6.2 FORMAT</b>					
<b>6.2.1 General</b>					
6.2.1.1	Are lists of menu and submenu items brief (five to nine options), arranged in aligned columns, and left-justified?				
6.2.1.2	Are menu options consistent in wording and order throughout the application?				
6.2.1.3	Are menu options arranged in logically related groups?				
6.2.1.4	When options are grouped in logical subunits, are groups of menu options displayed in a logical order?				
	If no logical order is apparent, are groups of menu options displayed in order of their expected frequency of use?				
6.2.1.5	Are small groups of menu options ordered by sequence or frequency of use?				
6.2.1.6	Are large groups of menu options ordered alphabetically?				
6.2.1.7	Are menu options listed numerically when task order is important?				
6.2.1.8	Can the user clearly distinguish between available and unavailable options?				
6.2.1.9	Are menu option lists formatted in single columns?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 6 - Menu Design

Section	Guideline	M/R	Y/N	N/A	Comments
6.2.1.10	Are menu items and control functions distinct (i.e., no overlap)?				
<b>6.3 HIERARCHICAL MENUS</b>					
<b>6.3.1 Usage</b>					
	Are hierarchical menus used for long lists of menu options when <i>not</i> all options can be displayed at once?				
	Are hierarchical menus used when a selection list exceeds 10-15 items?				
<b>6.3.2 General Guidance</b>					
6.3.2.1	Are hierarchical menus organized and labeled to guide the user through available selections?				
	Are currently active menu selections distinctly identified to the user (i.e., color and font, size and color of text, etc.)?				
6.3.2.2	Do hierarchical menus allow immediate access to critical or frequently selected options?				
6.3.2.3	In the hierarchical menu structure, is the user's current position indicated?				
6.3.2.4	Are display format and option selection logic consistent throughout the hierarchical menu structure?				
6.3.2.5	In a GUI, is hierarchical menu design simple?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.3.3 Navigating Hierarchical Menus</b>					
6.3.3.1	Is there a top-level menu providing basic system-level options?				
6.3.3.2	Are control options for the system-level menu grouped, labeled, and ordered by their logical function, frequency, and criticality of use?				
6.3.3.3	In hierarchical menus, can the user return to a system-level menu with one simple control action?				
6.3.3.4	In hierarchical menus, can the user return to the next higher-level menu with one simple control action?				
6.3.3.5	Are menu selections with branching options visually distinct from control actions?				
6.3.3.6	Do submenus pop up by selecting a menu option or by moving a pointer to the right?				
6.3.3.7	Are multiple paths provided to accommodate experienced and inexperienced users (e.g., experienced can type-ahead, jump-ahead, or other navigation shortcuts)?				
<b>6.3.4 Hierarchical Menu Tree Depth and Breadth</b>					
6.3.4.1	Is the hierarchical menu structure designed to minimize the steps required to navigate the menu?				
6.3.4.2	Is the menu hierarchy a broad and shallow menu tree rather than a narrow and deep menu tree?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
6.3.4.3	Is the number of menu choices minimized midway through a hierarchical menu?				
6.3.4.4	Can the user select a menu or submenu directly, without intermediate steps?				
	Can the user switch between software modules quickly and easily using navigation aides (e.g., using a tree or organization chart)?				
<b>6.4 ITEM SELECTION</b>					
<b>6.4.1 General</b>					
6.4.1.1	When pointing on menu displays <i>not</i> included with data displays, is the pointer automatically placed at the first listed option?				
	When menu selection is by code entry, is the pointer placed in the command entry area?				
6.4.1.2	Is the number of menu selections at absolute minimum to reduce selection time?				
6.4.1.3	Are two modes for menu selection available (e.g., by pointer selection or by keying a numeric/letter code)?				
6.4.1.4	Does the software acknowledge control entries and menu selections (i.e., animated where possible)?				
6.4.1.5	When menu selection is by code entry (other than mnemonics), is a standard command-entry area provided in a fixed location?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
6.4.1.6	Can menu options be selected by command or abbreviation (e.g., use Q, QU, or QUIT)?				
<b>6.4.2 Selection by Pointing</b>					
6.4.2.1	Where menu selection is the primary means of sequence control and long lists of options exist, can the user select by direct pointing (e.g., by mouse, trackball)?				
6.4.2.2	Does the pointing area for menu options include the displayed option label plus a half character distance around that label?				
6.4.2.3	Is menu selection a dual action (e.g., point and click)?				
<b>6.5 MENU OPTION LABELING</b>					
<b>6.5.1 General</b>					
6.5.1.1	Do menu items begin with a key word?				
6.5.1.2	Are menu options worded as commands to the computer rather than questions to the user (e.g., File, Save, Edit)?				
6.5.1.3	Are menu category labels comprehensible, unique, and stated clearly in English?				
6.5.1.4	If menu options are grouped in logical subunits, does each group have distinct labels?				
6.5.1.5	Are menus labeled distinctly and in familiar terminology?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.5.2 Selector</b>					
6.5.2.1	Are compatible or mnemonic letters used for menu selectors?				
	Are numbered menu items used as intermediate selectors?				
6.5.2.2	Do menu selectors consist of either all letters or all numbers ( <i>not</i> combined)?				
6.5.2.3	Are menu selectors closely matched to the item represented?				
6.5.2.4	Do menu item numbers start with 1, <i>not</i> with 0?				
6.5.2.5	Are the same letters consistently used to designate options from one transaction to another?				
6.5.2.6	Are code entries associated with each option displayed in a consistent, distinctive manner (e.g., P=Previous Page, U-Undo, etc.)?				
<b>6.6 DIALOG BOXES/POP-UP WINDOWS</b>					
<b>6.6.1 Message Wording Guidelines</b>					
	Is each abbreviation significantly shorter than the full word?				
	Are abbreviations meaningful, recognizable, and consistent?				
	Are unusual or uncommon abbreviations avoided (e.g., "Restricted Acct No," <i>not</i> "Restr Account Number")?				
	Do message lines end in full words rather than hyphenations?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 6 - Menu Design

Section	Guideline	M/R	Y/N	N/A	Comments
	Are messages directly usable (e.g., require no further documentation or translation)?				
	Are sentences short, simple, beginning with the main topic, and is technical wording avoided?				
	Is abrupt wording (e.g., INVALID, ILLEGAL, FATAL) avoided?				
	Do error messages focus on error correction and <i>not</i> on actions causing the error?				
	Are critical error messages displayed in caution/warning windows and noncritical in the window message area?				
	Has the HELP facility been used to expand on messages?				
<b>6.6.2 Work-In-Progress Window</b>					
	When response time is equal to or less than 5 seconds, is a changed pointer shape or brief message provided as feedback?				
	When response time exceeds 5 seconds, is a work-in-progress window provided?				
	If necessary, can the user cancel or abort the operation?				
	Does the application remove the work-in-progress box when the operation is completed?				
	Does the application show the status of the operation by a dynamically changing progress indicator (e.g., 10% sorted)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.6.3 Information Box</b>					
	Is an information box generated (e.g., Motif message box, OpenLook notice) for information messages?				
	Are information boxes reserved only for noncritical messages requiring the user to acknowledge?				
	Are frequent informational messages displayed in the window's message area?				
	When an information box freezes the application to require the user to dismiss the window before proceeding, is a "Retry" button provided for retries and a default push button designated for a desired action?				
<b>6.6.4 Caution/Warning Box</b>					
	Is a caution/warning box with critical messages provided to warn the user of consequences of completing an action (e.g., "Yes," "No," and "Cancel" buttons)?				
	Are caution/warning box messages unambiguous questions or statements?				
	When a caution/warning box is displayed, is the application suspended until the user provides instruction on how to proceed?				
	Is the default push button always the least destructive option?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 6 - Menu Design**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>6.6.5 Menu Box</b>					
	Is a menu box provided as a result of the user selecting a routing or window menu item?				
	Do menu boxes solicit data from users through a combination of controls (e.g., entry boxes and settings)?				
	Is the menu box named for the menu item that created it?				
	Is a "Cancel" push button included in the window for users to close the menu box?				
	If a default push button is designated, is it for the assumed desired action?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 6 - Menu Design

This page intentionally left blank.

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



### Chapter 7 - Direct Manipulation

M/R - Mandatory/Recommended  
 Y/N - Yes/No  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>7.1 GENERAL</b>					
<b>7.1.1 Hardware Considerations</b>					
	Are high-resolution screens and bitmapped hardware architecture used?				
	Is a positive image (e.g., dark foreground on light background) used?				
	Is a pointing device (e.g., mouse or trackball) used for direct manipulation?				
	Is software flexible enough to accommodate keyboard cursor keys or accelerators if the pointing device fails?				
<b>7.1.2 Screen Arrangement by the User</b>					
	Can the user arrange windows and icons on-screen to meet task needs but cannot move them to a non-retrievable position (i.e., off the screen)?				
<b>7.1.3 Function Control</b>					
	In direct manipulation, are functions, files, or operations invoked by Function Keys, Menu Bar, Pop-Up Menus, Pull-Down Menus, or Icons?				
<b>7.1.4 Interaction</b>					
	Do interactive tasks utilize most appropriate input modes (e.g., keyboard for alphanumeric data, pointing devices for menu selection)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Can the user select items with either the keyboard or pointing device when both modes are present?				
<b>7.2 METAPHORS</b>					
<b>7.2.1 Metaphor Selection</b>					
7.2.1.1	Does the metaphor model the system?				
7.2.1.2	Is the metaphor appropriate for the user's tasks, functions, and environment?				
7.2.1.3	Does selecting the metaphor leverage prior knowledge specific to the user's environment?				
7.2.1.4	Does the metaphor meaningfully represent system function to the user?				
7.2.1.5	Are metaphors general enough to allow the user to understand and use other metaphors or media?				
<b>7.2.2 Metaphor Design</b>					
7.2.2.1	Are complex metaphors avoided?				
7.2.2.2	Are metaphors simple, yet <i>not</i> oversimplified?				
7.2.2.3	Are objects representing functions consistent with the metaphor (e.g., trash can for delete with recovery, paper shredder for permanent deletion)?				
7.2.2.4	Are effective self-contained symbols (icons) used in preference to multiple icons of a complex metaphor?				
7.2.2.5	Do metaphors guide the user toward an understanding of the underlying functional system?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
7.2.2.6	Are negative connotations absent from metaphors, especially those used by other cultural/national groups (e.g., NATO forces)?				
<b>7.3 ICONS</b>					
<b>7.3.1 Types of Icons</b>					
	Do icons include objects that visually represent a service or concession ?				
<b>7.3.2 Icon Usage</b>					
	When direct manipulation is used, are icons used that are visual representations of available system functions?				
	Are icon (symbol) sets small enough to be easily learned?				
7.3.2.1	Can the user select system options from iconic menus of groups of icons?				
	Are iconic menus for control functions designed and tested for users who do <i>not</i> share a common language (e.g., NATO Forces)?				
	Is there a limit on number of icons shown at one time?				
	Is the screen divided into 1-icon cells, with uncluttered, consistent menu locations?				
	Are consistent locations provided for icons, while allowing the user to customize icon locations?				
	Are icon sizing and location consistent with other aspects of the design (e.g., windows)?				
	Are existing icons used when available?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Once an icon initiates an action (e.g., printing), are unavailable icons indicated visually?				
	Are icons highlighted when selected?				
7.3.2.2	Are command icons provided to represent frequently used computer commands and operations?				
	Have command icons been designed using general icon design principles?				
	To the extent possible, are command icons standardized and consistent across all DoD applications?				
	Are icons more standardized if they portray great risk or danger?				
	Are command icon meaning and function consistent across displays and standardized within an application?				
	Does commercial off-the-shelf (COTS) software meet the consistency requirements for icon use and design within an application?				
7.3.2.3	Can the user quickly access frequently used commands and macros through a horizontal or vertical layout of buttons?				
	Are button layouts customizable, including user-selectable functions and macros?				
	Do button layouts allow selection by keystroke and by pointing device?				
	Can the user display and also hide button layouts?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
7.3.2.4	When an icon represents more than one function, is each function selectable from a menu?				
7.3.2.5	Can the user switch from icons to textual representation of functions/files?				
	Does the textual representation list text sequentially?				
<b>7.3.3 Icon Design</b>					
7.3.3.1	Is icon meaning consistent across displays and standardized within the application and, to the extent possible, across all DoD applications?				
	Have a common set of primitives (e.g., code defining specific shape, form, or color) and boundaries for icons been used?				
	Is the icon distinguishable from other icons?				
	Can the icon be seen well from all angles?				
	Are icon pictures read from top to bottom, left to right?				
	Have concrete, simple symbols been used rather than abstract, complex ones?				
	Does icon design avoid ambiguity, ensuring that no more than one meaning can be attributed to an icon?				
	Are design principles transferred carefully from one environment to another?				
	Are invalid icons indicated and non-selectable once the user has initiated icon selection?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 7 - Direct Manipulation

Section	Guideline	M/R	Y/N	N/A	Comments
	Does every icon include attributes of color, location, and visibility?				
	Are existing, recognizable icons reused?				
	Are icons unique to an application <i>not</i> used?				
	Is use of company logos and other such unique icons avoided?				
7.3.3.2	Is icon design based on black and white rather than on color?				
	If used, is color-coding always redundant to another coding method?				
	Has color been used discretely, avoiding too much variation and clutter?				
	For color display, are 5 or fewer colors used for icons, including black, white, and/or gray?				
	Are simple color patterns used for background and low light areas?				
	Are colors limited to a carefully chosen set and used consistently across content areas and different display media?				
7.3.3.3	To distinguish specific functions, do text labels name each icon?				
	Is the icon label placed underneath the icon?				
	Is textual material in icon labels kept simple?				
7.3.3.4	Does icon shape visually match the user's expectation and associate between the icon and the function being controlled?				
	Does icon shape represent a concrete concept to the user?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are icon shapes as simple as possible (e.g., show or exaggerate natural features) to ensure user recognition?				
	Is a maximum of 20 unique icon shapes used?				
	Do multilingual icons use technological rather than natural shapes/forms (e.g., circles or triangles as areas, boundary lines with plus signs (+) as end marks)?				
	Are icons consistent with international usage (e.g. triangle is "caution")?				
	Are opposite functions depicted by mirrored icons?				
	Are figures oriented consistently with respect to text?				
	Can the user rotate 3-D icons (e.g., view from different vertical and horizontal angles)?				
7.3.3.5	Are icons at least 1/4 inch in screen height?				
	When size coding icons, are larger icons 1.5 times larger than the next smallest?				
	Is icon size coding limited to a maximum of five sizes, and preferably only up to three?				
	Is icon size-to-background ratio 1:1.5?				
	Has use of the same symbol in different sizes to mean different things been avoided?				
	Are icon size scales constant?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
7.3.3.6	Is the grouping of icons based on the proximity, similarity, and arrangement of objects that define a closed region?				
	Are objects arranged in straight or smoothly curving lines?				
	Is symmetrical icon grouping maintained when icons undergo simultaneous, correlated changes?				
	Are users prevented from inadvertently grouping unrelated icons?				
	Are images visually separated in 2D space?				
	Is a finite limit placed on number of icons shown at one time?				
	Is screen divided into cells to locate and relocate icons?				
7.3.3.7	Has the importance of a figure's size relative to its background been considered?				
	Are convex shapes used for figures and concave shapes for holes?				
	Is a contour line used to delineate only one area?				
	Has an object's position been considered as to how or whether that object is perceived as a figure?				
	Is greater contrast between object and background used to project the object as a figure?				
	Is icon figure-ground (e.g., foreground lines, etc.) clear and stable?				
7.3.3.8	Are icon boundary lines solid and closed, with high contrast to the underlying display background?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are optically consistent line weights used?				
	Are curved lines used?				
	Are corners smooth?				
	Are boxes around icons avoided?				
	When a boundary is left open, is that opening designed only to ensure that desired closures will occur ( <i>not</i> undesired automatic perceptual closures)?				
7.3.3.9	Is the meaning of an icon inherently obvious?				
	Do icons have intrinsic meaning to user, with no negative connotations?				
	Are icon designs avoided that could have a range of meanings?				
	Is consideration given to the design of representational or abstract vs. arbitrary or invented icons that must be learned?				
	Are learned icons as unique or compact as possible?				
	Are icons <i>not</i> overly realistic, stylized, simple, or complex?				
	Is icon design as concrete as possible?				
	Does grouping provide additional meaning to icons?				
7.3.3.10	Does the computer monitor offer sufficient resolution to identify icons at normal viewing distance?				
	On high-resolution screens at 60-150 dpi, are 30-60 pixels per inch used?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are icons designed to appear correctly in different screen display standards?				
	If icon display equipment has severe limitations in appearance or interaction characteristics (e.g., monochrome CRTs or touch-screen input), have the effects on appearance and use of icons been considered?				
	Has the intended display medium been considered in icon design?				
<b>7.3.4 Design Methodology</b>					
7.3.4.1	Were verbal contents and display environment analyzed to determine the relationships of complete icons and icon parts?				
7.3.4.2	Are sketches used to explore all possible icon design variations (i.e., visual elements, size, and approximate locations)?				
7.3.4.3	Is a style established in which icons are grouped by consistent approach or appearance?				
	Are users involved in establishing the style of icons?				
7.3.4.4	Is an underlying grid used to organize icon elements (e.g., point elements, gray patterns, curves, angles, length and width of rules)?				
	Have standard horizontal, vertical, and oblique lines and a limited set of sizes for objects been established?				
	Is a grid used to regulate groups of text/images and to determine the size of elements?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is an articulate, systematic method used to assign text/illustration areas, background field, or format?				
	Is a strong, easily recognized proportional format used when possible?				
	Are frequently used icons positioned around or near the screen edges?				
	Are the most important icons positioned in consistent locations on screen?				
7.3.4.5	Are large objects, bold lines, and simple areas used?				
	Is a pre-selected presentation style used continuously within the icon set?				
	Have sudden changes of emphasis or de-emphasis of objects, structure, or processes been avoided?				
	Are crucial elements of sufficient size compared to total icon size?				
<b>7.3.5 Icon Evaluation</b>					
	Is symbol/message association easy?				
	Are arbitrary symbols as unique as possible?				
	In a variety of cultures and situations, is the symbol equally appropriate?				
	Will the symbol/metaphor be appropriate in the future, or will they soon be obsolete?				
	Is the symbol pleasing and noncontroversial?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 7 - Direct Manipulation**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the symbol in accordance with existing international standard symbols (i.e., do <i>not</i> create new symbols if one already exists)?				
	Can the symbol or its elements be applied systematically for a variety of interrelated concepts?				
	Is the symbol easy to reproduce in a variety of environments and situations?				
	Can the symbol be transferred to different systems, enlarged, or reduced without losing crispness or detail?				
	Is the symbol distinguishable from other symbols?				
	Can the symbol be perceived from different distances, angles, and conditions?				
	Are icons designed to have intrinsic meaning to the user?				
	Do icons provide a visual representation that matches user expectations and allows association between the icon and function being controlled?				
7.3.5.1	Were icons tested with a group of users who represent the intended users?				
7.3.5.2	Are icons general enough to allow use of other metaphors or media?				
	Does application software allow creation of icons that represent "macro" instructions, thus allowing more effective use of these macros with the advantages of a visual representation?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 8 - Common Features

M/R - Mandatory/Recommended

Y/N - Yes/No

N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.1 TACTICAL SYSTEM COMMON FEATURES</b>					
<b>8.1.1 Date/Time Display</b>					
8.1.1.1	Is one of the following used: YYMMDD (YY last two digits of year, MM month, and DD day) or DD MMM YY (DD day, MMM month, and YY year)?				
8.1.1.2	Is time presented as HHMM{SS}Z, where HH is the hour of a 24-hour day, MM is the minute, SS (optional) is the second, and Z is the time zone?				
	Are colons or spaces used on the display or output format, unless otherwise specified (e.g., 11:30:24Z)?				
	Are colons or spaces generated as part of the form and <i>not</i> left to user discretion?				
8.1.1.3	Can users specify format for local time on hard-copy output and soft-copy display in non-operational/tactical settings but, in operational systems, only in Zulu (military Date/Time Group)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.1.1.4	Is military Date/Time Group displayed as DDHHMMZ MMM YY (DD is day, HH is hour of a 24-hour day, MM is the minute, Z is time zone – defaults to Zulu –, MMM is month, and YY is year, e.g., 041130Z JAN 91)?				
<b>8.1.2 Latitude/Longitude Display</b>					
	Are latitude and longitude displayed in two fields, with symbols for degrees, minutes, and seconds?				
8.1.2.1	Is DD(MM{SS})H format used (DD is the degrees of latitude, MM is the minutes of latitude, SS is the seconds of latitude, and H is the hemisphere)?				
8.1.2.2	Is DDD(MM{SS})H format used (DDD is the degrees of longitude, MM is the minutes of longitude, SS is the seconds of longitude, and H is the hemisphere)?				
<b>8.1.3 User-Definable Parameters</b>					
	Can users configure computer screens to individual preferences?				
8.1.3.1	Can users select background colors from a palette within a user-parameter selection window, (except for security banner colors or colors with specific tactical coded meaning)?				
	Is the selected color immediately displayed as a sample item within the selection window?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.1.3.2	Can users specify printer destination in network environments?				
8.1.3.3	Can users specify either left-handed or right-handed button configurations?				
8.1.3.4	Can experienced users bypass novice-level HELP messages?				
<b>8.1.4 Wild-Card Characters</b>					
	Are users allowed to use wild-card characters in queries and searches to support patterns?				
8.1.4.1	Can an @ replace any single alphabetic character (a-z, A-Z)?				
8.1.4.2	Can a # replace any single numeric character (0-9)?				
8.1.4.3	Can a ? replace any single alphanumeric character (a-z, A-Z, 0-9, or punctuation marks)?				
8.1.4.4	Can an * replace zero or more alphanumeric characters?				
<b>8.2 ON-LINE HELP</b>					
<b>8.2.1 Types of Help</b>					
	Does HELP reflect user requirements without significantly impacting application response time?				
8.2.1.1	Does HELP provide an interactive, context-sensitive source of information (e.g., valid entries, keystrokes, steps to complete tasks)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.2.1.2	Is HELP active, such that it interrupts inappropriate entries and suggests corrections?				
8.2.1.3	Does HELP provide on-line assistance or system documentation (e.g., a user guide or list of functions)?				
<b>8.2.2 General Design</b>					
8.2.2.1	Can the user access/exit HELP by a single keystroke?				
8.2.2.2	Are memory aids provided for running the application?				
8.2.2.3	Is basic information for novices included?				
8.2.2.4	Does on-line HELP explain— <i>not</i> repeat—the manual?				
8.2.2.5	Do on-line portions of the manual consist of selected parts— <i>not</i> the entire manual?				
8.2.2.6	Is all pertinent manual information included?				
8.2.2.7	Is use of jargon avoided?				
	If use of jargon is unavoidable, Is the jargon common to all users ?				
8.2.2.8	Is user overload avoided (e.g., the user is <i>not</i> expected to read more than three HELP displays or to remember more than five points)?				
8.2.2.9	Is HELP <i>not</i> used to teach novice users how to operate the system?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does Help provide step-by-step instructions to remind occasional users how to perform the most common tasks?				
<b>8.2.3 Accessibility of HELP</b>					
8.2.3.1	Is HELP available from every screen?				
8.2.3.2	Is the HELP command/function key displayed?				
8.2.3.3	If HELP is <i>not</i> available at all times or places in the program, is the status of HELP availability indicated by a displayed message?				
8.2.3.4	Can users access HELP easily (e.g., a single keypress/mouse-click)?				
<b>8.2.4 Provide HELP on HELP</b>					
8.2.4.1	Is an alphabetical index of HELP functions available to the user?				
8.2.4.2	Is an alphabetical index provided that includes all commands used by the software, with explanations and argument options?				
8.2.4.3	Is use of HELP function always demonstrated?				
8.2.4.4	Are means of obtaining HELP from anywhere in the system demonstrated?				
	Are alternative means of obtaining HELP demonstrated, including how quick and easy it is to use the options ?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are different meanings of the HELP display defined and their functions explained?				
8.2.4.5	Is navigation within HELP demonstrated (e.g., scroll, page, or jump to related topics)?				
8.2.4.6	Does the description of the active window include its function?				
	Does the description of the active window include tasks the user can perform?				
8.2.4.7	Are instructions for HELP provided on every HELP display?				
8.2.4.8	Are complete instructions provided on when to use information supplied by HELP?				
<b>8.2.5 Application Information</b>					
	Is a list of application capabilities provided?				
	Are application components, options, and structure described?				
8.2.5.1	Does HELP point out shortcuts and unused features?				
8.2.5.2	Are increasingly more detailed explanations of error messages provided (e.g., information and status)?				
8.2.5.3	Are successively more detailed explanations of questions, prompts, and terms provided?				
8.2.5.4	Are examples of correct input or valid commands provided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.2.5.5	Is a description of the format of a specified command provided?				
	Is a list of allowable commands provided?				
8.2.5.6	Is HELP user-centered (e.g., based on user task, <i>not</i> on application characteristics)?				
<b>8.2.6 Provide HELP in Context</b>					
	Does context-sensitive HELP describe the nature of specific controls (e.g., radio button, slider bar) and how to use them?				
8.2.6.1	Is HELP specific to each level of user interaction?				
8.2.6.2	Are correct alternatives listed when an incorrect command is entered?				
8.2.6.3	Is HELP provided within the application so that users are <i>not</i> required to close files, exit application, and/or log off to invoke HELP?				
8.2.6.4	Does the HELP display provide a split screen or window so that users can simultaneously view the application screen that relates to the HELP request?				
8.2.6.5	Can the user resize and reposition windows to simultaneously view HELP information and application screen (the problem)?				
8.2.6.6	Are application-specific keyboard meanings/assignments (e.g., function keys) displayed?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.2.7 User Control of the HELP System</b>					
8.2.7.1	Can the user initiate a HELP request and select the desired HELP topic?				
8.2.7.2	Can the user select a level of HELP when multiple levels are available?				
8.2.7.3	Can the user annotate existing HELP messages?				
8.2.7.4	Can the user obtain a list and explanations of HELP features?				
<b>8.2.8 Provide Consistent HELP Format</b>					
8.2.8.1	Is HELP consistent in location and usage across all screens?				
8.2.8.2	Is the process of moving from level to level to obtain more detailed information consistent throughout the application?				
<b>8.2.9 Self-Explanatory and Concise Displays</b>					
8.2.9.1	Do titles of HELP windows reflect their contents?				
8.2.9.2	Are HELP window titles consistent with the current screen (e.g., from an accident report format, is the title HELP: ACCIDENT REPORT)?				
8.2.9.3	Is the HELP display tailored to the current information request, to include only relevant data?				
8.2.9.4	Are error and HELP messages clear, concise, and appropriate to the user's experience level and training?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.2.9.5	Is the wording of labels, prompts, and user guidance messages task-oriented?				
	Does task-oriented wording incorporate special terms and technical jargon normally employed in the user's tasks?				
8.2.9.6	Are HELP messages written in short sentences?				
	Are HELP messages written in the active voice?				
	Are as many examples as possible provided for each HELP screen?				
	Is HELP information placed in tables, where applicable?				
	Does the HELP dialog provide an answer followed by its explanation?				
	Are the most likely HELP questions answered immediately?				
	Is the requirement to scroll and/or page through displays kept to a minimum?				
<b>8.2.10 Make Return To Application Easy</b>					
8.2.10.1	Can the user return to the application with only a single keypress or mouse-click?				
8.2.10.2	When a single keystroke exit from HELP is <i>not</i> possible, can the user return to the application easily, i.e., without calling up a menu?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.2.11 Keep HELP Current</b>					
8.2.11.1	Does HELP information reflect the current version of the software (e.g., updated with new releases)?				
8.2.11.2	Is data collected on the target population to tailor HELP to the appropriate user experience and training levels?				
<b>8.2.12 Provide User Options</b>					
8.2.12.1	Can the user flag specific HELP messages for easy referral later (i.e., bookmarking)?				
	To flag a HELP message, can the user select a bookmark option while viewing the message?				
	Can the user choose to view all messages or just the bookmarked ones?				
	Can displayed HELP messages be printed to allow users to study them further?				
<b>8.2.13 System-Initiated Messages</b>					
	Are system-initiated messages provided when an error/problem is detected (e.g., missing parameters, long lapses in response, etc.)?				
8.2.13.1	Do system-initiated messages have positive emphases, focusing on corrections to problems rather than causes of problems?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.2.13.2	Are system-initiated messages presented as advice or suggestions?				
	Are HELP messages <i>not</i> intrusive?				
8.2.13.3	Are HELP messages provided when incorrect user actions could result in serious consequences (e.g., deleting, replacing, renaming files or exiting without saving)?				
8.2.13.4	Do error messages include the error detected, input field, and corrective action?				
8.2.13.5	Is the purpose of the system-initiated message clearly indicated (e.g., to inform user of error, indicate status, prompt action, or provide feedback)?				
8.2.13.6	Can users turn off system-initiated messages or specify the level/type of message (e.g., advisory, caution, warning)?				
8.2.13.7	Are error messages written in specific, user-friendly terms (e.g., avoiding vague terms such as "syntax error" or obscure error code numbers)?				
<b>8.3 INTERACTIVE CONTROL</b>					
<b>8.3.1 General</b>					
8.3.1.1	When results of a control entry vary depending on prior actions, is a continuous indication of the current context displayed?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 8 - Common Features

Section	Guideline	M/R	Y/N	N/A	Comments
8.3.1.2	Can the user remove irrelevant items from the display and reverse this action (i.e., retrieve information that was removed)?				
8.3.1.3	When data exceed the capacity of a single display frame, is paging or panning/scrolling available?				
8.3.1.4	For interpreting user-composed control entries, are upper- and lower-case letters in control entries treated as equivalent?				
8.3.1.5	Is context-sensitive HELP available for unfamiliar terms and commands?				
	Does the interface display, in immediately usable form, the terminology and commands necessary to perform the task associated with the displayed information?				
8.3.1.6	Can the user pace the control entries?				
8.3.1.7	Is transaction sequence designed logically from the user perspective rather than from a programming or computer-processing perspective?				
8.3.1.8	Does the application routinely and automatically include informational elements required for every communication or transaction (e.g., call signs) after the first input?				
8.3.1.9	Can the user customize information displayed on a screen (e.g., for the tactical scenario)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.3.1.10	Are all displays designed so that features (e.g., prompts, advisories, etc.) relevant to interactive control are distinctive in position and/or format?				
8.3.1.11	Do applications adapt to individual differences and accommodate a variety of user abilities (e.g., accelerator keys for expert users)?				
8.3.1.12	When user response is required or demanded, are instructions displayed on how to respond?				
8.3.1.13	Are interactive control actions consistent in form and consequence (e.g., similar means to achieve similar ends throughout the application)?				
	Are results of control entries compatible with user expectations (e.g., NEXT PAGE calls up next page of the active file, <i>not</i> an unrelated file)?				
	Are names for interactive control functions semantically congruent with natural usage, especially for paired opposites (e.g., to move cursor up, use UP; for down, use DOWN, <i>not</i> LOWER)?				
8.3.1.14	Can user complete control entries or actions through an explicit action (e.g., ENTER) before the system interrupts to indicate a computer-recognized word?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are control actions simple, especially those that require rapid user response, permitting completion of a task with the minimum number of actions, consistent with user abilities?				
	Can the user make control entries as needed (e.g., stacking commands)?				
	Are sequences of control entries <i>not</i> slowed by delays in computer response (e.g., standard system response times between keystroke and screen response are in 5-50 ms range with a maximum of 0.2 sec)?				
8.3.1.15	Does the system provide periodic feedback to indicate normal operation if user waits more than 15 sec?				
	Does the computer acknowledge control entries immediately and provide an observable system reaction?				
	For lengthy computer processing, is an overt and positive indication of completion provided?				
	Is feedback displayed for all user actions (e.g., key entries displayed stroke by stroke)?				
8.3.1.16	Does keyboard lockout occur when application processing causes input delays and no keyboard buffer is available?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	When keyboard lockout terminates, is a clear indication provided to the user?				
	When control lockout occurs, can the user abort the transaction causing the lockout (e.g., via a special function key), without resetting the system and losing previous processing?				
	Does the system provide the user the option to reset the system?				
8.3.1.17	Is speed of computer response to user entries appropriate to the type of dialog (e.g., immediate for menu selection, function keys, and most entries during graphic interaction)?				
	Is speed of computer response to control entries appropriate to the transaction (e.g., those perceived as simple have faster response times)?				
8.3.1.18	Is the current pointer position indicated by displaying a distinctive pointer symbol at that position?				
	Is the pointer symbol distinctive and in high contrast to the background (i.e., recommended minimum contrast ratio of 3:1)?				
	Is pointer size large enough to distinguish the pointer from background "clutter"?				
	Are the means of pointing the pointer at display elements/ locations easy, accurate, and consistent?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is pointing a dual action for graphics data entry (e.g., first position a pointer, then confirm that position to the computer)?				
<b>8.3.2 Context Definition</b>					
8.3.2.1	Does the interactive control aid user understanding of the context for tasks being performed?				
	Does the system prompt expected user actions (e.g., results of previous steps, display of current options)?				
8.3.2.2	Is interactive control software designed to interpret current control actions in the context of previous entries (e.g., no reentry of data)?				
	Is the user prompted to perform the next logical action?				
8.3.2.3	Can the user request a summary of the results of prior entries (i.e., history file) to help determine present status?				
8.3.2.4	When the operational mode defines context, are the current mode and other pertinent information displayed to the user?				
8.3.2.5	Is context information displayed in a consistent, distinctive location throughout all related applications?				
8.3.2.6	When performing operations on a selected display item, is that item highlighted?				
8.3.2.7	Can the user review any active control parameter(s)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.3.3 Transaction Selection</b>					
8.3.3.1	When only one next step exists to continue to the next transaction, is a consistent control option (e.g., ENTER) provided?				
8.3.3.2	When using keyed commands or option codes entries for interactive control, are defaults defined as null control entries indicated to the user?				
8.3.3.3	Can user specify transaction timing (e.g., when requested transaction should begin and end, or when repeated transactions are periodically scheduled)?				
8.3.3.4	When the user must select options by code entry, is the code associated with each option displayed in a consistent, distinctive manner?				
8.3.3.5	When it is desirable <i>not</i> to change the menu list, can the user clearly distinguish between available and unavailable options?				
8.3.3.6	Can the user "key" or enter a sequence of commands or option codes as a single stacked control entry?				
	Are command names, their abbreviations, or option codes accepted as if the control entries had been entered separately?				
	Can the user define and use macros?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is a predefined informational query process included in all applications that provide a user database interface?				
	Is the order for stacked commands consistent with that required for separate control entries?				
8.3.3.7	Is the pointer displayed in the control entry area when keyed entries are required?				
	When pointing is required to select options, is the pointer displayed on the first (most likely) option?				
8.3.3.8	Is information to guide control entries provided to the user?				
	Are prompts incorporated at any point in a transaction sequence and/or provided in response to HELP requests?				
8.3.3.9	Is a general list of basic control options always available (e.g., home base or starting point)?				
<b>8.3.4 Interrupts</b>					
8.3.4.1	Is a nondestructive REVIEW option provided (e.g., review sequence of entries, make changes, and return to first display in a defined transaction sequence)?				
8.3.4.2	Are PAUSE and CONTINUE options available that interrupt and later resume a transaction sequence without changing data entries or control logic?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.3.4.3	Is an indication of PAUSE option status displayed when selected and a CONTINUE prompt available to resume the action?				
8.3.4.4	Is an END option provided to conclude a repetitive transaction sequence?				
8.3.4.5	Can the user easily abort, escape, or exit an operation or function?				
8.3.4.6	Does the system provide a dynamic, visible indication that action is continuing and that informs user of "working" status?				
8.3.4.7	Is a SUSPEND option provided that preserves current transaction status and permits resumption of work when the user later logs back on to the system?				
	Is the SUSPEND status indicated when the user selects that option?				
	Is the user prompted with procedures that resume the suspended transaction at the subsequent log-on (e.g., "Type EXIT to return to suspended application")?				
8.3.4.8	Does the system interrupt only when necessary to prompt response, provide essential feedback, and to signal errors?				
8.3.4.9	Is a CANCEL option provided to erase changes and restore current display to its previous version?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.3.4.10	If different types of user interrupts are provided, is each designed as a separate control option with a distinct name?				
8.3.4.11	Is a nondestructive GOBACK option provided to display the previous transaction?				
8.3.4.12	Is a RESTART option provided that cancels entries made in a defined transaction sequence and returns to the beginning of the sequence?				
	Is the user required to CONFIRM the restart when data entries or changes will be nullified by restart?				
<b>8.3.5 Error Management</b>					
8.3.5.1	When a control entry (including log-off) will cause extensive change in stored data, procedures, and/or system operation (particularly if <i>not</i> easily reversed), is the user notified and required to confirm the action before implementing?				
8.3.5.2	Does the CONFIRM prompt warn users of possible data loss?				
8.3.5.3	In stacked commands, does the system consistently execute to the point of error or require user to correct errors prior to execution?				
8.3.5.4	Is user notified when only part of a stacked command can be executed and given the guidance and option to correct, complete, or cancel the stacked command?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
8.3.5.5	Can user easily GOBACK to previous steps in a transaction sequence to correct an error or make changes?				
8.3.5.6	Is an explicit action (e.g., ENTER) required to reenter corrected material, whether a command entry or data entry?				
	Is the same explicit action (e.g., ENTER) used for reentry that was used for the original entry?				
8.3.5.7	If an element of a command entry is <i>not</i> recognized or is logically inappropriate, does the system prompt the user to correct that element without reentering the entire command?				
8.3.5.8	After the data transaction is complete and errors are detected, can the user correct errors directly and immediately?				
8.3.5.9	Is a specific CONFIRM action provided (e.g., function key or dialog box), different from the ENTER control, to confirm questionable or destructive control or data entries?				
8.3.5.10	Can any user action be immediately reversed by an UNDO command?				
8.3.5.11	Does the system provide an appropriate response to all control entries, correct or incorrect?				
8.3.5.12	Is software consistent in the use of terms, and are only the most explicit terms used?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are complex terms (e.g., "SAVE & Apply" or "EXIT to Prior Screen") avoided when possible but, when used, do they retain one consistent meaning within the application?				
	Is "CANCEL" used for cancel functions rather than a simple acknowledgment such as "OK?"				
8.3.5.13	Are notices, alerts, and informational displays visible until the user responds specifically (e.g., no automatic time-outs)?				
8.3.5.14	Is user protected from inadvertent double clicks of the pointing device?				
	Is this protection consistent with user and system requirements?				
8.3.5.15	Does the system cue the user to, but prevent selection of, unavailable options?				
	Is output fields data entry prevented without user acknowledging selection of the option?				
	Is data entry prevented in any inappropriate field?				
<b>8.3.6 Alarms</b>					
8.3.6.1	Does the method for acknowledging an alarm avoid inhibiting or slowing down the response to the condition causing the alarm?				
8.3.6.2	Can user turn off auditory alarms without erasing the displayed message?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	For noncritical alarms, is a simple method for acknowledging and turning off the signal provided?				
8.3.6.3	Are alarm signals and messages distinctive for each class of event (e.g., INCOMING MESSAGE ALERT, TERMINAL STATUS)?				
8.3.6.4	When monitoring tactical situations or tactical data status, can the user define the conditions (e.g., priorities, percentages, target flight path, etc.) that result in a software-generated alarm, alert, or status message?				
<b>8.4 FUNCTION KEYS</b>					
<b>8.4.1 General</b>					
8.4.1.1	Are function keys used for frequently required control entries, tasks requiring error-free entry, and interim control entries?				
8.4.1.2	When the system does <i>not</i> immediately acknowledge function key activation, are users provided with some other form of computer acknowledgment and feedback?				
	Are users always notified that system functions are being activated ?				
8.4.1.3	Are function keys temporarily disabled when <i>not</i> required for current transactions?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are users <i>not</i> required to apply mechanical overlays to temporarily disable function keys under computer control?				
8.4.1.4	Does each function key control only one function?				
	When a function key controls more than one function, is the actual or current meaning of the function displayed by soft keys on the screen?				
8.4.1.5	Are soft function keys displayed on-screen located close to the actual keyboard and spatially oriented consistently with keyboard function keys?				
8.4.1.6	Can the user activate the function represented on a soft key by either the function key or a by pointing device (e.g., mouse)?				
8.4.1.7	Is the current subset of active multifunction keys clearly indicated (e.g., highlighting the soft key label)?				
8.4.1.8	Is overloading of function keys avoided (e.g., are no more than two functions per key used)?				
	Is user provided with all necessary function controls that are required to perform the task?				
8.4.1.9	After changing functions assigned to a key set, can the user easily return to base-level functions or menu?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.4.2 Consistency</b>					
8.4.2.1	Are equivalent or similar functions assigned to the same key in different operational modes?				
8.4.2.2	Is the function assigned to a particular key in one transaction assigned to the same key in other transactions?				
<b>8.4.3 Double Keying</b>					
8.4.3.1	If double keying (e.g., control/ shift) is used, are functions paired on one key logically related?				
8.4.3.2	If double keying (e.g., control/ shift) is used, is the relation consistent between shifted and unshifted functions?				
<b>8.4.4 Labeling</b>					
8.4.4.1	Is each function key clearly labeled to designate the function it performs?				
	Are labels distinct and different from one another?				
8.4.4.2	When keys are assigned more than one function, is the currently available function indicated?				
8.4.4.3	When options are selected through variable function keys, are function key numbers (e.g., F1) avoided as option designators?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 8 - Common Features**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>8.4.5 Layout</b>					
8.4.5.1	Is the layout of function keys compatible with their importance (e.g., emergency functions placed prominently and distinctively coded by size and/or color)?				
8.4.5.2	Are safeguards (e.g., physical protection, prompts) provided for keys with potentially disruptive consequences?				
8.4.5.3	Are function keys grouped in distinctive keyboard locations (e.g., frequently used keys in more convenient locations)?				
<b>8.4.6 Single Keying</b>					
8.4.6.1	Can function keys perform their labeled functions with a single activation, and will <i>not</i> change that function with repeated activation without an indication?				
8.4.6.2	Is a continuously available function assigned to a single key?				
8.4.6.3	Are frequently used functions assigned to a single key action (e.g., <i>not</i> double keyed)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 9 - Text

M/R - Mandatory/Recommended

Y/N - Yes/No

N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>9.1 TEXTUAL WINDOWS</b>					
<b>9.1.1 Data Field Labeling</b>					
	Do window displays conform to paper forms, with field order in logical sequence for the user?				
	Is the layout of data fields consistent within the application?				
	Are data field labels easily distinguished from actual data (e.g., by using different fonts for labels or special characters as separators)?				
	Is columnar data distinctly separated with at least three spaces between columns?				
	Are column headings displayed above the data and at least one row separating the column heading and the data?				
	Are labels consistent throughout an application or set of applications?				
	Are field labels protected and transparent to keyboard control so that the cursor skips them when spacing or tabbing?				
	Are dimensional units (e.g., \$) associated with a field always displayed as part of the label?				
<b>9.1.2 Updatable Fields</b>					
	Are updatable fields distinguished by underscores below the data field?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 9 - Text

Section	Guideline	M/R	Y/N	N/A	Comments
	If highlights or colors are included, are they consistent throughout?				
	Do cues distinguish required fields from optional fields, and are they consistent throughout an application/set of applications?				
	When field length is variable, is the user <i>not</i> required to right- or left-justify or remove blanks from entered data?				
	Can the user enter data in familiar units?				
	Does the application perform required conversions (e.g., between geographic, geodetic, and Military Grid Reference System coordinates)?				
	Can authorized users selectively inhibit updatable fields in a multi-field display?				
<b>9.1.3 Text Cursor</b>					
	If the user clicks on a non-updatable field or anywhere else on the form, does the text cursor remain fixed?				
	Does the text cursor move between and within fields with the mouse and by Return/Enter, Tab, or arrow keys?				
	Except for password and non-display fields, are displayed characters unobscured by the cursor?				
	In "insert" mode, does text cursor appear between the characters where inserted text will be placed?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 9 - Text**

Section	Guideline	M/R	Y/N	N/A	Comments
	In overwrite mode, is this current status indicated (e.g., on status bar) or does text cursor highlight the character that will be replaced?				
<b>9.2 FORM FILLING</b>					
<b>9.2.1 General</b>					
9.2.1.1	Is form-filling dialog used as an aid for composing complex control entries?				
	Is form-filling dialog used as a means of displaying default values for the parameters in complex control entries?				
	Is form-filling dialog used for tasks where flexibility in data entry is needed (e.g., including optional as well as required items), where users have moderate training, and/or where computer response may be slow?				
9.2.1.2	When editing forms with multiple entries, are GOBACK, CANCEL, and RESTART available for editing the form prior to final input into the system?				
9.2.1.3	Is data entry accomplished by explicit action (e.g., pressing the ENTER key)?				
<b>9.2.2 Defaults</b>					
9.2.2.1	Are default values automatically displayed in their respective data-entry fields?				
9.2.2.2	Does the default definition remain unchanged when a default value is replaced in a data-entry field?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 9 - Text**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>9.2.3 Consistency</b>					
9.2.3.1	Are forms for control entry consistent in format?				
9.2.3.2	When data is entered from hard copy into a computer, are the computer forms and hard-copy formats identical?				
9.2.3.3	Are dialog strategies for entering words and numbers consistent throughout the system?				
9.2.3.4	For data and/or processes that have standard information requirements, are standard formats provided as part of the data screen?				
	Do message formats include a template for the standard format?				
<b>9.2.4 Cursor Movement</b>					
9.2.4.1	Is cursor movement restricted from moving into non-data-entry fields during form filling?				
9.2.4.2	Is a convenient method provided for cursor control (e.g., tab, enter key, or pointing device)?				
9.2.4.3	Is an explicit action required (e.g., hit tab control ) to advance to the next data-entry field?				
9.2.4.4	Is the device-to-cursor movement ratio close to 1:1?				
	Can the user select the movement ratio?				
9.2.4.5	When a data-entry form is retrieved, is the cursor automatically positioned in the first character space of the first data-entry field?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 9 - Text

Section	Guideline	M/R	Y/N	N/A	Comments
<b>9.2.5 Data Field</b>					
9.2.5.1	Are data in variable-length data-entry fields automatically justified or truncated?				
	Are leading characters <i>not</i> required?				
9.2.5.2	Are data field formats consistent throughout and among the applications?				
	Is the data field format convention consistent with the user's expectations?				
9.2.5.4	Are data fields longer than 5 to 7 characters separated into subgroups of 3 to 4 characters using a space or delimiter?				
	Does the division of data fields into subgroups follow a convention consistent with the user's expectations (i.e., names and addresses should <i>not</i> be divided)?				
9.2.5.5	Do data fields have distinctly marked boundaries?				
9.2.5.6	Are data-entry fields clearly identified, particularly by positive visual means?				
9.2.5.7	Are data entry fields of a fixed length, with visual cues provided for their length?				
9.2.5.8	Does data entry <i>not</i> require overwriting existing or default information?				
	Is the data entry field empty or, if a default value exists, is the user required to perform an explicit action to erase existing or default data?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 9 - Text

Section	Guideline	M/R	Y/N	N/A	Comments
9.2.5.9	Does numeric data in decimal format use the decimal as part of the data display?				
	Is the field size adequate for the range of numeric data?				
<b>9.2.6 Error Management</b>					
9.2.6.1	Can the user easily correct errors on a character-by-character or field-by-field basis?				
9.2.6.2	Is the user prompted with understandable messages when an unacceptable value is entered in a data field?				
<b>9.2.7 Form Layout</b>					
9.2.7.1	Are page numbers provided when multiple screens are used for a transaction?				
	Can the user rapidly return to any page?				
9.2.7.2	Are related data fields grouped on the same form?				
9.2.7.3	Are explanatory messages provided for data fields that become visible when a cursor is placed in a field, when a user queries a field by clicking on the title, or by a context-sensitive help system?				
9.2.7.4	Are messages and instructions on a form distinct from data-entry fields (e.g., consistently located and/or highlighted)?				
9.2.7.5	Are data fields separated by boundaries or visible space?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 9 - Text**

Section	Guideline	M/R	Y/N	N/A	Comments
9.2.7.6	Are data-entry fields grouped and ordered logically (e.g., by task, sequence, frequency, or importance)?				
9.2.7.7	Does each dialog display page have a meaningful title at the top of the form?				
9.2.7.8	Are optional fields labeled or coded in a readily apparent manner?				
9.2.7.9	When a data entry field in a form is optional, are all values displayed in that field default values?				
9.2.7.10	Does the software prevent the user from bypassing a mandatory data-entry field?				
<b>9.2.8 Labeling</b>					
9.2.8.1	Do data fields (unless similar or identical) have distinctive, explicitly descriptive labels?				
9.2.8.2	Are field labels located directly to the left or above the entry field and separated by at least one character?				
9.2.8.3	Are similar data entry fields labeled and located consistently for all forms?				
9.2.8.4	Are labels and instructions consistent among applications to the extent possible across all systems?				
9.2.8.5	Are data field labels composed of terms familiar to the user and the task to be performed?				
9.2.8.6	Will it be easy for the typical user to understand the data field labels?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 9 - Text

Section	Guideline	M/R	Y/N	N/A	Comments
9.2.8.7	Are units of measure part of the data field label?				
	If measurement units can change, does this portion of the label change automatically when new units are selected?				
9.2.8.8	Are blanks and nulls in a data field visibly distinctive?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

M/R - Mandatory/Recommended  
 Y/N - Yes/No  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>10.1 MAPS AND SITUATION DISPLAYS</b>					
<b>10.1.1 General</b>					
10.1.1.1	When displaying large geographic areas, is the earth's curvature on flat surface maps projected consistently?				
	Can the user determine the type of map projection used?				
10.1.1.2	Can situation displays be presented as overlays on related map backgrounds?				
10.1.1.3	Are map labels positioned consistently (e.g., beneath or within the feature)?				
	Are all significant features labeled without cluttering the display?				
10.1.1.4	Is the map orientation consistent when more than one map will be displayed (e.g., north consistent for all maps)?				
	Are all maps north-oriented with the north direction annotated?				
10.1.1.5	Are color, shading, texture patterns, or highlighting used to define map areas of special interest?				
	When using shades of color or texture patterns, does the gradation of shades from dark to light correspond to variation in the variable that is represented?				
10.1.1.6	Are automated tools for complex map analyses provided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 10 - Graphics

Section	Guideline	M/R	Y/N	N/A	Comments
	Have user needs and requirements been determined and specific/appropriate tools provided?				
10.1.1.7	Can the user select one graphics item within a densely packed group, and highlight the selected item?				
<b>10.1.2 Static Display Attributes</b>					
10.1.2.1	Do maps cover user areas of responsibility at each organizational level, and provide all essential details required to conduct operations?				
	Is map display of sufficient size to permit simultaneous presentation and visual integration of information required by the user ?				
	Are panning and zooming used in small electronic displays to increase map coverage?				
	Are all critical map features represented?				
	Do labels remain legible at all display resolutions?				
	Can the user reduce clutter while preserving essential information?				
	Can commanders of a land-based maneuver unit view their own areas of operation—one echelon above and two below—and the activities of friendly adjacent (flanking) units?				
	Are the activities of adjacent and deep enemy units opposing displayed friendly forces presented also?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.1.2.2	Are symbols placed accurately on the map or connected by arrows, lines, or other pointing graphics?				
	Can graphic data with background map information be registered at all display scales by automated means?				
10.1.2.3	Are colors, symbols, line size/quality, and fonts consistent throughout a given system?				
	Does display symbology conform to published standards?				
	Can the system also use a commercial graphics editor to create and display system-unique features and symbols?				
	Are standard military symbols used in accordance with doctrine?				
	Can the user obtain help in identifying unknown symbols or other map information (e.g., highlight a symbol and query for identifying information)?				
	Are standard military map color codes used and keys defining the colors codes provided?				
	Are overlapped map symbols avoided, or if unavoidable, can the user move symbols to the foreground when overlapping occurs?				
	Are essential labels (e.g., unit identification) displayed with the symbol or on the key or legend?				
	Is alphanumeric coding used to label graphic data?				
	Are symbol labels positioned consistently in accordance with doctrinal guidance?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are digital terrain and elevation data (DTED) used to provide alternative methods of portraying terrain features and data for map overlays depicting road networks, drainage, vegetation, and soil type?				
	Are shading, coloring, or other visual cues used to accentuate terrain features (e.g., contour intervals)?				
10.1.2.4	Does a display of coordinates associated with the cursor in user-selectable coordinate units remain constantly visible?				
	Can the visible display of coordinates be changed conveniently?				
	Is the continuous display of location augmented with the capability to fix (point on map) a location to facilitate moving overlay displays?				
	Can the coordinate display concurrently display multiple coordinate units?				
	Can a pointing device be used to obtain map coordinates for a selected symbol?				
	When the entire map is not displayed, is a map inset provided to show where the portion displayed is located within the larger map?				
	Can the user automatically determine the distance between points?				
	Can the user readily determine the bearing between points?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.1.2.5	Are bounding boxes used when maps are displayed in the main graphics drawing area?				
	Are bounding coordinates for the geographical areas displayed?				
<b>10.1.3 Dynamic Characteristics</b>					
	Can the user in a map graphics application make measurements, perform analysis, and control the appearance of the display?				
	Can the user scan and change the scales of maps and update map overlays?				
10.1.3.1	Can the user change the displayed area by moving a window over the map in any direction?				
	Are panning operations (i.e., panning or moving a window over the map) continuous (preferable) or discrete, and do they meet the user's requirements?				
	During panning, does an indicator provide position in the overall display?				
	During panning, can the user rapidly return to the starting point?				
10.1.3.2	Can the user zoom to obtain a larger view or greater detail?				
	Does zooming <i>not</i> cause problems in reading symbols, labels, or other map features?				
	Does the level of detail (i.e., number of symbols and features) match the degree of zooming?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Of the two methods of zooming (i.e., continuous and discrete), is continuous used in preference to discrete, as possible?				
	Is the method of zooming satisfactory to the user?				
	When zooming, are symbols collapsed into fewer summary symbols to declutter?				
	Can the user quickly return to the normal display size when zooming?				
	Is a continuous indication of map scale provided while zooming?				
	Does a map inset or window indicate maximum available map coverage?				
	Is the map insert interactive and used to set parameters for calling up a screen map display?				
10.1.3.3	Can the user select categories of information to be automatically updated?				
	Are stable reference elements (e.g., terrain, boundary) provided when displays are automatically updated?				
	Can the user readily identify display updates/changes and easily recognize/distinguish critical changes (e.g., highlight the update until the users acknowledges it)?				
	Can the user control the frequency of display updates and freeze the display to prevent further updates?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 10 - Graphics

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the rate of display update match the perceptual abilities of the user to permit successful visual integration of the changing patterns?				
	Can the user freeze the display to prevent further updates and resume when necessary?				
	Is a warning provided while the automatic display updating is suspended and when resuming automatic updating?				
10.1.3.4	Is display sequencing used to reduce clutter, reproduce temporal changes in the display database, and aid in visualizing simulated changes in battlefield situations?				
	Can the user control the rate of sequencing?				
	Can the user pause/suspend sequencing?				
	Is an indication of sequencing status provided?				
	Can the user present sequenced displays in forward or reverse order?				
	Can the user return quickly to a selected display within a sequence of displays?				
	Is animation used to aid the pictorial display for complex objects?				
10.1.3.5	Is a user-selectable grid overlay provided that is keyed to the map coordinate system of the map?				
	Can the user easily turn the grid on and off?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is coordinate keying of the overlays clearly specified and easily operated by the user?				
10.1.3.6	Is relevant information continuously displayed on an associated window that includes map scale, cursor location, graphic of map coverage, and status (i.e., "working," "computing," "available," etc.)?				
10.1.3.7	Does the cursor have a point designation feature (e.g., cross-hairs or V-shaped symbol)?				
10.1.3.8	Is a function provided that calculates distance (range) and azimuth (bearing) between any two selectable points or symbols?				
	Can the user select distance units (feet, meters, or kilometers)?				
	Is Azimuth displayed in degrees from true north?				
10.1.3.9	Does the "determine position" function calculate the position of an identified point and present the answer to the user?				
	Can the user select the coordinate system for displaying the calculated position of a point (e.g., UTM, latitude/longitude, or MGRS)?				
	Are answers provided textually in user-specified units of measure, distance, and azimuth?				
<b>10.1.4 Creating And Editing Map Graphics</b>					
10.1.4.1	Are a library of standard symbols and a means of copying and manipulating symbols provided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.1.4.2	Can the user easily label symbols?				
10.1.4.3	Are automated tools provided to assist the user in constructing new symbols and graphics overlays?				
10.1.4.4	Can users preview graphics displays prior to printing them?				
10.1.4.5	Can the user add or delete features (e.g., symbols, labels) without destroying background information?				
	Can the user expand an area of the display to accurately place critical data?				
	Can the user designate (e.g., highlight) graphical elements for editing and to visually cue forthcoming actions?				
	Can the user reposition selected elements on the display?				
	Can the user remove and restore selected elements?				
	Can the user change display attributes (e.g., color, symbols, etc.) by selecting from a list of options?				
	Does the user select an option by pointing rather than by naming the option?				
	Can the user easily identify attributes currently selected?				
	Can the user change the attributes of selected graphic elements?				
Can the user easily name, store, and retrieve graphic displays and elements?					

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Can the user review and select graphics displays and elements from stored graphics files?				
<b>10.1.5 Map Display Characteristics</b>					
10.1.5.1	When an application is map-intensive, is the map used as background or base screen of maximum display size?				
10.1.5.2	Is the readability of map features ensured by limiting displays and windows that obscure the map?				
10.1.5.3	Are map cursors designed as crosshairs with high contrast to the background and a preferred size of 20 min. of visual angle?				
10.1.5.4	Can the user use overlays to display (make visible), hide from display (make invisible), or delete?				
	Can the user preselect or filter (i.e., declutter) graphic overlays?				
	Can the user easily understand labels and titles used to identify filters?				
	Are filters extended to include map features (e.g., roads, cities, vegetation, topography, and political data)?				
	Do feature overlay displays use standard map symbols as a default (e.g., railroads, dams, and roads)?				
	Is the intensity of the map controllable to allow fadeout of the map without losing all the map features?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is text information unobscured and offset by arrows to preserve map legibility?				
	Can the user display a list of available map overlays that distinguishes between visible and invisible overlays?				
	Is a map overlay editor function provided?				
	Has creation of overlays with the same name or title been prevented?				
	Are overlay feature legends displayed at user request?				
10.1.5.5	If color is used, is redundant coding used (i.e., both green color and the word "unclassified" to indicate classification) to ensure readability by all users?				
	Are visual color illusions caused by color blending avoided (e.g., adjacent red and blue lines are seen as one purple line)?				
<b>10.2 PRESENTATION GRAPHICS (GRAPHS, PICTURES, AND DIAGRAMS)</b>					
<b>10.2.1 General</b>					
10.2.1.1	Are complex formats (e.g., 3-D presentations and artistic embellishments) avoided?				
10.2.1.2	Is clarity preserved when graphics are reproduced or reduced in size?				
	Is application window sizing controlled so that no graphic shows partial lines?				
10.2.1.3	Are presentation styles appropriate to the user's training and experience?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Do the graphics include user-expected symbols?				
10.2.1.4	Are only the data needed for a specific task provided?				
10.2.1.5	Can users select alternative presentation styles?				
10.2.1.6	Can the user select data elements on the graph and display the associated values?				
10.2.1.7	Can the user select between graphical and tabular data formats?				
10.2.1.8	Are design, format, labels, etc. consistent among presentation styles?				
10.2.1.9	Are the displayed graphics clearly labeled?				
<b>10.2.2 Creating and Editing</b>					
10.2.2.1	Are computer aids provided for entering and organizing complex graphic data?				
10.2.2.2	Are data entries validated?				
	Does automated validation include comparison to a standard range and/or use of rules for relationships among variables?				
	Is the validation process a part of the application software?				
10.2.2.3	When plotting formats are known, are templates or other data-entry aids provided to facilitate entry of graphic data?				
10.2.2.4	Are editing, construction capabilities, and plotting of stored data automated?				
10.2.2.5	Are automated aids provided for scaling graphic data?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 10 - Graphics

Section	Guideline	M/R	Y/N	N/A	Comments
10.2.2.6	Are automated aids provided for drawing straight and curvilinear line segments?				
	Is rubberbanding used (i.e., a visible line connects a point to current cursor position) which is permanent when selected?				
	Are automated aids provided for joining and intersecting line segments?				
	Can the user identify and select line segments for moving and editing?				
	Can individual line segments be grouped to allow actions to be taken on the grouped object?				
	Are optional, adjustable, grid references provided for aligning horizontal and vertical lines?				
10.2.2.7	Can the user specify attributes, relationships, and design rules and have the computer apply these rules automatically (e.g., straighten hand-drawn lines)?				
10.2.2.8	Are computer-aided drawing methods provided?				
	Is a system of prompts or other means to aid the user in the design process provided?				
10.2.2.9	Can the user edit or create drawings in large-scale which will be automatically reduced to the desired scale?				
10.2.2.10	Can the user resize, copy, move, and rotate displayed objects, including grouped objects?				
10.2.2.11	Can the user obtain a mirror image of a display object?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.2.2.12	Can the user select and group graphic elements to edit in common?				
10.2.2.13	Can the user automatically fill enclosed areas with selected attributes (e.g., color or texture)?				
10.2.2.14	Do computer models generate graphical displays in response to parameters provided by the user?				
<b>10.2.3 Scales, Labels, and Coding</b>					
10.2.3.1	Are standard scaling conventions used (e.g., values on horizontal axis increase to the right of origin; values on vertical axis increase going up from the origin)?				
	Are independent variable (time or casual events) plotted against the horizontal axis?				
	Are dependent variables (effects) plotted against the vertical axis?				
10.2.3.2	Are standard meanings for graphic symbols applied consistently?				
10.2.3.3	Do printed outputs use texture (e.g., pattern) for coding, while visual displays use color?				
10.2.3.4	Are texture patterns simple (e.g., hatched or shaded), avoiding patterns that produce visual illusion of vibration and motion?				
10.2.3.5	When expanding scales to emphasize a limited range of data, do breaks in axes indicate discontinuities with the origin?				
10.2.3.6	For extreme scaled data, are the X and Y axes duplicated, respectively, at the top and right sides of the graph?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.2.3.7	Is use avoided of exaggerated scales that minimize distortion or suppress trends in the data?				
10.2.3.8	When users must compare graphs, are identical formats and scales provided, or are data sets plotted on the same graph?				
10.2.3.9	Are linear scales used in preference to nonlinear scales, when practical?				
10.2.3.10	Are logarithmic scales used when comparisons of rates of change and percentages are required?				
	Are logarithmic scales used where numbers of both extremely large and extremely small orders of magnitude populate the graph?				
10.2.3.11	Are multiple scales avoided on the axes of a single graph?				
10.2.3.12	Are tick marks numbered or labeled corresponding to major scale divisions on the axes?				
	Do labels on tick marks include descriptions and units of measure on each axis?				
10.2.3.13	Are axes labeled in multiples of whole numbers/decimals starting with zero and divided into 10-12 major scale divisions, each containing up to 9 subdivisions?				
10.2.3.14	Do numeric data scales begin with zero, when comparing quantities or different series?				
10.2.3.15	Do labels use upper- and lower-case sans serif fonts, oriented left to right?				
10.2.3.16	Are labels used in preference to legends or keys to identify plotted data elements?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are labels oriented horizontally and located adjacent to the referenced elements?				
	Are arrows, lines, or similar pointing conventions also used to connect labels to their respective data elements?				
10.2.3.17	Are legends or keys that identify graphic data elements located within the bounds of the graph, unless such positioning interferes with displayed data?				
<b>10.2.4 Identifying Critical Data</b>					
10.2.4.1	Are reference or baseline values displayed when comparative evaluation against a fixed standard is required?				
10.2.4.2	Is supplementary text used to emphasize features of data requiring attention?				
10.2.4.3	Are actual data values included on graphic displays, where precise values are required?				
10.2.4.4	When labeling graphic data, is text positioned consistently with respect to graphic elements?				
<b>10.2.5 Grid Lines</b>					
10.2.5.1	Are grid lines easily distinguishable, <i>not</i> obscuring graphed data?				
10.2.5.2	Is excessive use of grid lines avoided?				
	Are grid lines located using the guidelines for placement of major scale values?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are more grid lines used where greater precision is required or where the size of the display will permit their use?				
10.2.5.3	Can the user determine whether or not grid lines will be displayed?				
<b>10.2.6 Types of Presentation Graphics</b>					
10.2.6.1	Are line graphs (smoothed curves or straight lines) used when displaying relationships between continuous variables (e.g., time variation)?				
	Are multiple curves on a single graph labeled clearly, each designated with an adjacent label?				
	When a legend is used, are legend codes listed in the order in which curves occur in the graphs?				
	When multiple curves are displayed, is a curve containing critical data highlighted?				
	Is line coding used to distinguish among multiple curves on the same graph?				
	Is line coding used consistently when the same types of data appear on different displays?				
	Is a distinct line code (e.g., dashed or dotted lines) used to project values beyond the actual data set?				
	For cyclic data, is at least one full cycle of data provided?				
	Where comparisons are necessary, has the difference between the two series been plotted?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
10.2.6.2	Is texture or shading used to indicate the area between curves?				
	Is the series of surface curves stacked with the least variable series at the bottom and the most variable at the top?				
	Are labels placed within the textured or shaded bands, if space is available?				
10.2.6.3	Do bar graphs conform to user expectations?				
10.2.6.4	Are scatterplots used to show how variables are related or to represent the spatial distribution of data (e.g., impacts on a target)?				
	In scatterplots, are significant data points highlighted?				
10.2.6.5	Are labels oriented normally on the segments of pie charts?				
	Do segment labels include numbers that indicate percentages and/or absolute numbers represented by the segment?				
	Are segments that require emphasis highlighted or displaced slightly?				
<b>10.2.7 Pictures</b>					
10.2.7.1	Where detailed representation of objects is required, are graphic pictures used?				
10.2.7.2	Are automated aids used to help perform detailed analyses of image data?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



Chapter 10 - Graphics

Section	Guideline	M/R	Y/N	N/A	Comments
<b>10.2.8 Diagrams (Schematics)</b>					
10.2.8.1	Are diagrams used to illustrate spatial relationships when the level of detail provided by pictures is <i>not</i> needed?				
	When diagrammed data span separate sections, are consistent notations and an overview of the diagram provided, together with easy movement among sections?				
	Are portions of diagrams requiring emphasis highlighted?				
	Can the user rotate displayed diagrams to gain different perspectives?				
10.2.8.2	Are flowcharts used to provide the user a schematic representation of sequential processes?				
	Are flowcharts used as aids to problem-solving when solutions can be reached by answering a series of questions?				
	Are flowchart elements sequenced logically or path lengths minimized to reduce size?				
	Does layout of flowchart paths conform to standard orientation conventions (i.e., left to right, top to bottom, or clockwise)?				
	Are coding schemes for flowchart elements applied consistently?				
	Are standard directional conventions used when arrows connect elements of flowcharts?				
	Is highlighting used to direct user's attention to significant elements?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 10 - Graphics**

Section	Guideline	M/R	Y/N	N/A	Comments
	When using flowcharts as decision aids, is only one decision required at each step?				
	Is the user provided with a logically ordered list of available options?				
	Are options displayed at decision points worded consistently?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

M/R - Mandatory/Recommended  
 Y/N - Yes/No  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>11.1 USE OF DECISION AIDS</b>					
<b>11.1.1 Cognitive Considerations</b>					
	Are decision aids matched to the cognitive limitations/biases and styles of decision-makers and designed to minimize complexity and to allocate adequate time to each planning phase?				
<b>11.1.2 External Factors</b>					
	Are the external factors that influence decision quality (e.g., information overload, time stress, limited information, and training) considered in designing decision aids?				
	Does the decision aid assist less experienced users by performing/leading some of the required steps, and by filling in knowledge gaps?				
<b>11.1.3 When to Use Decision Aids</b>					
11.1.3.1	Do decision aids help the user overcome the difficulties of managing complexity (e.g., managing large amounts of data or visual representations, combining multiple criteria, allocating resources, managing detailed information, and selecting and deciding among alternatives)?				
11.1.3.2	Do decision aids help the user in performing time-consuming activities by improving the timeliness of the process?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
11.1.3.3	Do decision aids help the user overcome uncertainty resulting from limited data?				
11.1.3.4	Do decision aids help the user overcome human cognitive limitations (e.g., dealing with uncertainty and emotional components of decision-making, problems in retention and cognitive biases)?				
<b>11.1.4 When to Consider Alternatives</b>					
	Were alternatives considered when decision aids may <i>not</i> have been advisable?				
11.1.4.1	Are decision aids <i>not</i> used when solutions are obvious or one alternative clearly dominates all other options?				
11.1.4.2	Are decision aids used only when sufficient time is available or the user is authorized to make decisions?				
11.1.4.3	Are decision aids <i>not</i> used where it is appropriate to defer to human ability to generalize?				
11.1.4.4	Are decision aids <i>not</i> used for situations where adaptation may suffice?				
<b>11.1.5 Cautions and Limitations</b>					
	Is caution used when introducing decision aids, especially when they include functions that reduce the role of human judgment?				
11.1.5.1	Do decision aids maintain user attentiveness and an active role, while <i>not</i> encouraging user complacency or reducing accuracy?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
11.1.5.2	Do decision aids maintain an active user role, helping to maintain sustained attention and prevent longer response times?				
11.1.5.3	Does decision aid design consider the user's ability to discriminate between correct and incorrect automated decisions?				
11.1.5.4	Does decision aid design consider preconceived user attitudes or fears of automation (e.g., when planning the user's role and capability to override automated decisions)?				
<b>11.2 DEFINING DECISION AID REQUIREMENTS</b>					
	Do decision aids focus on difficult rather than routine tasks?				
<b>11.2.1 Understand Tasks</b>					
	Is design based on an in-depth understanding of tasks performed and conditions of performance?				
	Are decision aid requirements defined in conjunction with users and known experts in the field?				
	Do users participate with the group of experts?				
	When obtaining information from the experts, is a means provided to identify the criteria used to reach decisions?				
	Do decision aids match the situation and limitations they are designed to support?				
	Are decision-aided functions appropriate and compatible with the user's decision processes?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is only one decision aid provided for each task?				
<b>11.2.2 Understand Requirements</b>					
	Is decision aid development driven by requirements rather than by technology?				
	Are areas where users actually need help identified and decision aids matched to needs of the intended user?				
	Are the decision situation and goals recognized, and does the design focus on the highest level goal?				
	Is skepticism concerning automated decision support anticipated?				
	Is perceived utility recognized as the dominant factor in users accepting decision aids?				
	Does the decision aid add capabilities or increase efficiency in performing decision-making tasks?				
	Are user population characteristics considered in designing the decision aid and its interface?				
<b>11.2.3 Types of Aids</b>					
	Do types of aids and presentation formats vary according to the phases of the decision process (i.e., alerting, acquiring, evaluating, and responding) and factors such as time stress?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>11.2.4 Function Allocation Between Humans and Computers</b>					
	Is allocating functions between humans and computers based on cognitive task analysis, <i>not</i> on what is achievable using current technology?				
	Does decision aid design recognize that aided performance may <i>not</i> exceed unaided performance?				
	Does decision aid design prevent or minimize increased workload?				
	Are all critical aspects of the decision addressed to ensure the aid is complete for its intended purpose?				
	Does the decision aid design recognize that a user's decision-making behavior is contingent upon the task and context within which it is performed?				
	Is the decision method suitable to probable variations in task and context?				
	Is the decision aid viewed as advisor rather than decision-maker?				
	Are trivial or uncomplicated applications avoided?				
<b>11.3 FEATURES OF DECISION AIDS</b>					
<b>11.3.1 General Design Considerations</b>					
	Is the decision aid easier to use than the process it replaces?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the decision aid flexible, versatile, and easy enough to benefit typical users (i.e., users don't need to be subject matter experts)?				
	Do decision aids use terminology and criteria appropriate to the target user group?				
	Is the decision aid easy to control and understand?				
	Does the decision aid provide timely response to <i>ad hoc</i> requests and facilitate exchange of information to influence decisions?				
	Are decision aids tailored to the resources available to the user?				
	Does the decision aid automatically identify meaningful patterns and relationships and notify the user?				
<b>11.3.2 Provide Decision Alternatives</b>					
	Does the decision aid support development and evaluation of multiple, feasible alternatives?				
	Does the decision aid present a set of possible feasible alternatives, but <i>not</i> display all of the options when that would be too complex?				
	Does the decision aid display the goals served by the different alternatives and applicable options?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the decision aid support evaluating decision options by generating alternatives, allowing input of user alternatives, assigning and explaining probabilities, exploring solutions, rank-ordering alternatives, and providing rating guidance?				
<b>11.3.3 Prediction, Simulation, and Modeling</b>					
	Can the application predict future data?				
	Does the application make historical data available, to make comparisons, search for precedents, and assist the user in visualizing trends?				
	Does the decision aid alert the user when it predicts a future problem or opportunity upon which the user needs to act?				
	Is the capability provided to model, simulate, and support "what if?" exercises and make predictions based on current conditions?				
	Are models appropriate, designed to answer specific questions, and validated?				
<b>11.3.4 Identify/Assess Factors Underlying Decisions</b>					
	Can the user obtain and assess weights for multiple criteria and combine weights from multiple sources?				
	Are multiple criteria statistically independent, when possible?				
	Are causal factors identified, ranked by importance, and weights assigned?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the application allow users to modify the decision factors and weights?				
	Does the application allow users to provide and adjust risk factors used in decision models (e.g. pair-wise comparison techniques)?				
	Does the decision aid explain contributions of underlying factors and support sensitivity analysis?				
	Does the aid identify and assess operations constrains and inform the user (upon request) of decision aid boundaries or other limitations?				
	Does the decision aid provide the user with the assumptions that underlie modes and parameters and a history of the aid's past performance?				
	Can the user easily provide input into the aid's decision?				
	Can the user add new decision factors and set the range of conditions (within the decision aid's set limits), the level of output detail, and the parameters for optimization?				
	Is a means of saving and reusing the user's modifications provided, but also a means to return to default settings?				
	Does the decision aid assist in visualizing interacting factors?				
	Does the decision aid ensure the validity of elements added to the decision model (e.g., those used over successive applications)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>11.3.5 Handling Decision Aid Recommendations</b>					
	Does the decision aid calculate and display results of selected options?				
	Can the decision aid assess costs, risks, and benefits of all alternatives?				
	Does the decision aid provide rationale behind outputs or recommendations?				
	Does the decision aid indicate certainty or uncertainty when making recommendations?				
	Does the decision aid identify missing or uncertain data and their impact on the recommendations?				
	Does the decision aid include internal consistency checks to prevent contradictory predictions and recommendations?				
	Does the decision aid inform the user when it cannot handle the current situation?				
<b>11.4 USER REQUIREMENTS</b>					
<b>11.4.1 General Considerations</b>					
	Is the decision aid user-friendly and beneficial to the user, and does it present information that is readily understood by the user?				
	Does the decision aid have sufficient "intelligence" to adjust to user task requirements, where possible and appropriate?				
	Does the decision aid use accepted methods and accommodate user changes?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Once the decision method is determined, does the user retain control throughout the process?				
	Does the decision aid provide feedback on the method and current stage of processing?				
	Are data-entry requirements reduced by setting user-changeable defaults for data-entry fields?				
	Does the decision aid automatically alert the user to new developments occurring in the database or as a result of predictive modeling?				
	Is user participation encouraged in the decision process?				
	Does the system represent problems and solutions as users do?				
	Does the system foster user "ownership" of decisions and allow user to exercise judgment over decision aid results (e.g., provide sufficient information about the process and end result)?				
	Does the decision aid provide automated guidance in defining/analyzing a problem and formulating a decision?				
	Does the decision aid alert the user when user input is required, but <i>not</i> make the user dependent, so the process cannot be completed when the system is unavailable?				
	Do decision aids avoid presenting too much data ?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are decision aids used to reduce, filter, and preprocess data into a form useful to the decision-maker?				
	Are increased workloads avoided?				
	Are users prepared for changes and possible increases in work effort, and alerted to the aid's abilities to increase effectiveness?				
	Does the aid reduce complexity by providing only the information required to perform tasks allocated to the user and relevant to the immediate task?				
	Does the system provide only essential information, not repeating available information?				
	Does the decision aid present information using a level of abstraction, resolution, or detail appropriate to the immediate task?				
	Under time constraints, does the decision aid anticipate the user's needs and provide autonomous decision-making?				
	Can the user extend/personalize the decision aid?				
	Can models created or modified by users be validated, and sufficient warnings provided about the consequences of failure to validate?				
	Can the decision aid be easily returned to a default state?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the decision aid analysis flexible in allowing user control over the data retrieval/analysis process?				
	Can the user select the degree of analysis and time frame to be considered?				
	When the system asks questions, does the user have the option either to change the question or <i>not</i> answer it?				
	Does the system accommodate the various information requirements of commanders and staff users, including the ability to adjust the level of detail?				
	Can the system create a user profile containing preferences and jargon?				
	Are procedures provided for different levels of expertise (e.g., mental imagery for experts and rule-based procedures for novices)?				
<b>11.4.2 Decision-Aid Interface</b>					
	Does the interface support intelligent dialogue between the user and the decision aid?				
	Does the interface reflect tasks to be performed, tailoring them to the available resources (e.g., adapt to user; understand user's goals, needs, and abilities; interpret poorly formulated queries; correct user errors; and overcome user limitations)?				
	Does the system help prevent errors and provide automatic error recovery?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Can the user customize formats?				
	Does the application associate and group data meaningfully, to minimize the user requirements to customize formats; and do the displays match the task?				
	Does the system minimize the user's requirements to make format changes by associating and grouping data meaningfully, and making displays match the task?				
	Is HELP designed in accordance with guidelines?				
<b>11.4.3 Explanations</b>					
	Do the decision aids provide domain-specific explanations, guidance through the decision process, and procedural help on system use to guide the user?				
	Are explanations easy to understand (e.g., use familiar terms, incorporate user concept of the problem, and maintain consistency with the task)?				
	Are short explanations provided initially, and detailed explanations available on request?				
	Are trade-offs weighed in what the user can learn about the decision aid and what the decision aid can/should explain to the user?				
	Is the user assisted in locating key elements of the decision model, as related to a specific decision task?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the decision aid provide the capability to explain the current decision model or method and to justify using component factors?				
	Are the decision aid's algorithms documented and available for user inspection?				
<b>11.4.4 Training</b>					
	Are backup systems and regular training provided for user tasks that have been replaced by decision aids, especially for handling infrequent or critical events?				
	When decision aids are available, are users trained regularly in all skills required to maintain proficiency on backup systems?				
	Is the user trained to recognize errors/inappropriate uses of the decision aid?				
	Is the user provided with accessible lists of limitations that include limitation information and errors in embedded training?				
	Are users instructed <i>not</i> to categorically accept a decision aid's capabilities?				
<b>11.4.5 Decision Graphics and Displays</b>					
	Are graphics, textual reports, and input screens prepared in formats familiar to users?				
	Can the user control formats or select from alternate preprogrammed formats?				
	Are inaccurate graphics avoided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are historical displays available (e.g., time-sequenced presentations)?				
	Are spatial rather than textual formats used when extensive spatial processing and time constraints are involved?				
	Are tables rather than graphs used when reading specific data points?				
<b>11.5 ORGANIZATIONAL FACTORS</b>					
<b>11.5.1 Information Requirements</b>					
	Are decision aids flexible in meeting information requirements at different organizational levels?				
	Do decision aids accommodate different levels of detail and time constraints at each echelon?				
	Are command and control decision aids distributed (i.e., support multiple, cooperating decision-makers at different locations sharing a common database)?				
	Do decision aids support the entire command and control process, <i>not</i> just isolated phases?				
<b>11.5.2 Entire Organization</b>					
	Have impacts of decision aids on the entire organization been considered?				
<b>11.5.3 Complementary</b>					
	Do decision aids complement existing tasks and information-distribution systems?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 11 - Decision Aids**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>11.6 FLEXIBILITY</b>					
<b>11.6.1 Change-Over Time</b>					
	Are decision aids adaptable (i.e., accommodate growth, evolve with changing conditions/doctrine)?				
	Are policies and implementation mechanisms established for change?				
	Do decision aids adjust to changing situations and user preferences?				
<b>11.6.2 Maintainability</b>					
	Are decision aids maintainable by the user (e.g., rules, data, and decision logic)?				
<b>11.6.3 Type of Support</b>					
	Can the user tailor decision aid support to meet changing conditions?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

M/R -Mandatory/Recommended  
 Y/N - Yes  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>12.1 GENERAL RECOMMENDATIONS</b>					
<b>12.1.1 Ease of Use</b>					
	Is query language easy to learn and use?				
<b>12.1.2 Interactive Queries</b>					
	Are on-line query methods used in preference to batch or off-line query methods?				
<b>12.1.3 Use Assistance</b>					
	Does the application provide a step-by-step method for creating complex queries and narrowing a search?				
<b>12.1.4 Error Detection</b>					
	Is user alerted to syntax errors and, if possible, to semantic faults (semantic integrity)?				
<b>12.1.5 Minimum Training</b>					
	Is only minimum training required?				
	Is the interface easy to use without extensive training?				
<b>12.1.6 User-Oriented Design</b>					
	Were the end users included in the system interface design, including development and implementation?				
<b>12.1.7 Multiple Search Options</b>					
	Is the interface format appropriate to the search tasks to be performed?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	When more than one type of query is possible, does the interface format provide the best average performance?				
	Are multiple query and display formats provided, so the user can change format or when the nature of the search task changes?				
<b>12.1.8 Appropriate Displays</b>					
	Are displays appropriate (e.g., displays that facilitate quick responses are not necessarily the same as those that produce accurate responses)?				
	Are spatial, verbal, and tabular formats used effectively (e.g., spatial for recall, recognition, and speed and verbal for greater accuracy)?				
<b>12.1.9 Individual Preferences</b>					
	Is the DBMS consistent with user expectations?				
	Can the format be tailored to user preferences?				
<b>12.1.10 Displaying Results</b>					
	Is data displayed numerically or graphically?				
	Are graphic and numeric data displays used appropriately and effectively?				
<b>12.2 QUERY SCREEN DESIGN</b>					
	Are screens designed to optimize user scanning (e.g., minimize eye movements, follow consistent pattern, etc.)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>12.2.1 Screen Design Principles</b>					
	Is the displayed information relevant only to the current action/decision?				
	Are transactions or screens limited to what is necessary to perform actions, make decisions, or answer questions?				
	Is information grouped in a logical or orderly manner, with the most frequently requested information located in the upper left corner?				
	Is the most frequently requested information located on initial screens for multiscreen transactions?				
	Do spaces and lines balance the screen perceptually to ensure that the screen is not overloaded?				
	Are terminology, commands, formats, and general appearance consistent throughout the interface?				
<b>12.2.2 Query Screen Organization</b>					
	Is the query screen organized in a logical, orderly, and meaningful manner?				
	Is the most frequently requested information located in the upper left-hand corner on the screen?				
	If there are multiple screen transactions, is the most frequently requested information on the earliest transaction screens?				
	Are data fields easily scanned and identified?				
	Are data fields columnized top to bottom and left to right?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Are screens organized for top-to-bottom scanning?				
<b>12.2.3 Captions (Labels)</b>					
	Are captions complete, in clearly understandable language, and in upper case?				
	Is reverse video or highlighting for labels avoided?				
	Are caption fields for single fields located on the left side of the field, separated by a unique symbol and one space (a colon ":" is recommended)?				
	Are caption fields for multiple fields located one line above and centered over the column of data fields?				
<b>12.2.4 Data Fields</b>					
	Does the interface visually emphasize data fields (e.g., field labels)?				
	Are data displayed in a directly usable format?				
	Does the displayed data fully spell out codes and compressed information?				
	Does the displayed data include natural splits or predefined breaks?				
	Is data displayed in strings of five or more characters (numbers or alphanumeric with no natural breaks)?				
	Are data strings in groups of three or four characters with a blank or other delimiter between each group?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are data strings left-justified, and numeric data right-justified or justified about the decimal point?				
<b>12.2.5 Data Organization</b>					
	Is the data organized in accepted and recognizable order, with vertically aligned captions and data fields in columns?				
	Are data displays justified consistently?				
	Are columns, captions, and headings spaced to promote readability with at least one space between the longest caption and data field column, and between each heading?				
	Are section headings on-line located above related screen fields, with captions fully spelled out and indented a minimum of five spaces from the beginning of the heading?				
	Is a screen identifier/page number in the upper right-hand corner in multiscreen transactions?				
	Are error and status messages located consistently in a separate area of the screen?				
	Are error and status messages emphasized by use of a contrasting display feature (e.g., reverse video, highlighting, or a series of unique symbols)?				
	Are different forms of information display provided for different search tasks?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the interface provide a selection of display formats and a review format for review of certain fields without retrieving the entire record?				
<b>12.3 USER REQUIREMENTS</b>					
<b>12.3.1 Search Enhancements</b>					
	Are query optimizers used, and do they remain invisible to the user?				
	Can the user rank search terms by importance?				
	Are the ranked search terms used in a formula for automatically ranking records by relevance in the retrieval set?				
	Are additional search terms in a retrieval set (e.g., a memo field to list additional search terms related to a particular field)?				
	Does the application allow redisplay of results of the previous search without requiring reprocessing?				
<b>12.3.2 Automatic Functions</b>					
	Are spelling variants automatically recognized (e.g., color versus colour)?				
	Are acronyms automatically recognized?				
	Are variations in romanization automatically recognized (e.g., Peking versus Beijing)?				
	Are inverted forms automatically included (e.g., Newborn Infant to Infant Newborn)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is punctuation automatically removed from search terms when matching them against search-key values?				
<b>12.3.3 Word Stemming</b>					
	Are rules applied for reducing words to root forms by stripping them of their suffixes (e.g., reduce, reduction, reducing)?				
	Does the search automatically include all words containing a given root (e.g., the word "form" is the root of formation, inform, and information)?				
	Are rules provided for exceptions based on the language of the discipline or specialty area?				
	Is truncation allowed?				
	Does the application automatically search for words/phrases that begin with the same character stem (e.g., term for terms, terminate, terminal)?				
<b>12.3.4 Erasing</b>					
	Can individual characters and/or entire lines of input be immediately deleted prior to processing?				
	Can the user interrupt messages or displays without disconnecting (e.g., by using a break or interrupt key)?				
<b>12.3.5 User Satisfaction</b>					
	Are results provided in a timely manner?				
	Are the appearance, print format, and organization of output natural to the user?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the level of effort required of the user minimal, including the limitations or qualifications the application places on search output?				
	Are maximum search capability and retrieval effectiveness achieved (e.g., database size <i>not</i> increased to a point where retrieval time is excessive without also improving search methodology to compensate)?				
	Does the system help formulate searches to ensure maximum usefulness of results?				
<b>12.4 USER-FRIENDLINESS</b>					
<b>12.4.1 Commands</b>					
	Are mnemonics used to eliminate the necessity to remember syntax (i.e., as sequences or specification in output instructions)?				
	Are commands used in an easy-to-learn, user-oriented system language?				
	Are commands clear and unambiguous?				
	Is data entry <i>not</i> physically awkward for the user?				
	Can data be entered using a minimum number of keystrokes?				
	Can the user define Ctrl key, Alt key, or function key combinations (i.e., Ctrl/Alt/Del to reboot the system) in place of keystroke combinations?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	When a command will delete stored information, is a complimentary command provided to reverse the action?				
	If deletion of stored information is irreversible, can the user reconsider the action?				
	Does the application check for meaningless commands against a list of authorized commands, then allow the user to enter a revised command, rather than to automatically abort the procedure?				
	Are abort or escape facilities available for the user to control the dialog flow?				
<b>12.4.2 Computer Messages</b>					
	Are messages clear, simple, and concise (e.g., briefest message that can be properly interpreted and specific and in context of the current working environment)?				
	Do messages warn the user of irreversible action?				
<b>12.4.3 Error Messages</b>					
	Do error messages provide instructions in a positive, helpful manner?				
	Do error messages appear when a user enters a command that is misspelled, improperly formatted, or cannot be processed because it is inappropriate to the situation?				
	Do error messages provide instruction for revising erroneous commands?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
<b>12.4.4 Documentation</b>					
	Is full system documentation available in manual form?				
<b>12.4.5 Tailor the Interface</b>					
	Is the interface tailored to user needs?				
	Are frequently used queries tailored?				
	Where the value of only one or two parameters changes, is the user provided default values for those parameters?				
	Do macro definition procedures allow users to define commands and personalize their environment by encapsulating frequently used query sequences in a new command?				
	Can the user store the macros as files or define function key combinations to perform the function?				
<b>12.4.6 Accelerators</b>					
	Are accelerators provided to save keystrokes (e.g., keys dedicated to common functions)?				
	Does the application permit direct commands as alternatives to menu options?				
<b>12.4.7 Backup</b>					
	Is the user shielded from system failure)?				
	Are backup facilities provided both internally by the software application program and externally by the operating system?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
<b>12.4.8 Restore</b>					
	Is a restore utility provided to facilitate recovery of damaged /destroyed data from backup copies?				
<b>12.4.9 Interrupt</b>					
	Can the user interrupt work and resume later at the same point?				
<b>12.5 SEARCHING</b>					
<b>12.5.1 Commands</b>					
	Is a database SELECT command provided?				
	Are commands provided to create/and erase sets?				
	Can the user combine two or more sets to create new sets?				
	Can the user specify report formats, and save the formulating query and report format for later use?				
	Can the user name the report, identify the relations from which the report will be derived, determine the report layout, and define the lines and headings or captions?				
	Can the user restrict the output of retrieval sets?				
	Can the user save search results easily?				
	Can the user request a list previous search commands (e.g., history file)?				
<b>12.5.2 Control Functions</b>					
	Are system control functions provided to aid the user?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Do system control functions signal the user about the system's current state or perform an action based on the state?				
	Can the user MARK fields/records (e.g., for deletion)?				
	Is the current field value the input parameter for the MARK command?				
	Does the application note the marked value for future reference?				
	Is the current field value used as a parameter for the DESCRIBE command?				
	Does DESCRIBE provide a detailed explanation/description of the field?				
	Is the current field value used as a parameter for the DROP command?				
	Does DROP delete the current field from the structure?				
	Can the user query the application for status information?				
	Does status information include the completion and success or failure of the last search operation executed?				
<b>12.5.3 Editing Commands</b>					
	Is a text-editing box provided for typing search queries, and are edit functions available (e.g., CUT, PASTE, SEARCH, SPELL CHECK)?				
	Does CUT remove the selected text and place it in a clipboard?				
	Does COPY duplicate selected portions of text and place them in a clipboard?				
	Does PASTE place text from the clipboard into the current text?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Does CLEAR remove all characters currently in the text-editing box?				
	Does SEARCH locate a word/group of characters in the text-editing box?				
	With SEARCH, does REPLACE allow the user to replace a word/set of characters with another word/set?				
	Does SPELL CHECK compare words in the text-editing box with words in a dictionary of recognized words?				
	Does SPELL CHECK check textual commands to assure correct spelling and syntax?				
<b>12.5.4 Query Formulation Commands</b>					
	Do query applications build functions as needed for developing application programs, as well as update and maintain tables?				
	Does SELECT identify fields to include in query results?				
	Does COMPILE generate an executable function and check for correctness?				
	Do RUN or DO QUERY commands cause execution of the query?				
	Does the application monitor the execution of the query with prompts for input and error recovery?				
	Does the SHOW command allow various presentations of a tabular result, including a preview of query or report results?				
	Does MODIFY allow the user to change the query definition of an already existing query or report?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Can the new query be saved to a file or as a report?				
	Does SAVE store the query for reuse or modification?				
	Are queries stored in a file with a unique extension, such as ".QRY?"				
<b>12.5.5 User-Friendly Searching</b>					
	Are abbreviations significantly shorter than the original word or mnemonic?				
	Are both abbreviations and full terms accepted?				
	Are search terms automatically completed as soon as the system recognizes the term to be unique?				
	Does the application stop the user from typing once the search is uniquely identified?				
	When a query overloads the system, does the system inform the user and allow the user to terminate the query or continue?				
<b>12.5.6 Features</b>					
	Can the user navigate through the database interactively or use BROWSE when queries would be too lengthy to run interactively?				
	Can query results be formatted as reports?				
	Can the user view the list of words and phrases available for searching and term variations, including a link to a database thesaurus to suggest search terms?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



Chapter 12 - Query

Section	Guideline	M/R	Y/N	N/A	Comments
	Do parsing decisions provide search flexibility, regardless of how fields were parsed?				
	Is a proximity search available (e.g., search words in a positional relationship from word index fields such as titles or abstracts)?				
	Are words in either a specific order or independent of order, (e.g., the words "query" and "formation" could be searched in the same field)?				
	Is the use of Boolean logical operators (e.g., AND, OR, NOT) allowed?				
	Is the user prompted for sets consisting of search terms?				
	Does the application combine (intersect) the sets of search terms to enable search as a combined (union) set?				
	Does the application also allow interactive editing of queries?				
	Can the search be performed in a series of steps (e.g., using set building techniques), then view the records that answer a query as a set defined by the query?				
	Is range searching included?				
	Is range searching based on an ordered sequence using FROM and TO?				
	Can the user specify the search fields?				
	Is a controlled vocabulary of natural language terms used to help novices formulate queries?				
	Can search terms be selected from key words in records?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	Does the interface display search terms and prompt user selection?				
	Are additional search terms ranked by frequency of appearance in a retrieval set and provided to users in ranked order?				
	Does the system search on specific data field values input by the user ?				
	Does the application provide a list of possible field values from which users select?				
	Can the user order the field values (e.g., alphabetically or greatest number to the smallest)?				
	Can the application perform a crossfile search (e.g., obtain the number of references in all potential databases for the search terms/search profile)?				
<b>12.6 MULTIPLE LEVELS</b>					
<b>12.6.1 Accommodate Novice and Experienced Users</b>					
	Are different levels of interaction provided for users with varying degrees of experience?				
	Can the user change levels at any time?				
	Is a tutorial mode available?				
	Is context-sensitive HELP offered at all levels?				
<b>12.6.2 Novice Users</b>					
	Is the interface design user-friendly (i.e., minimal computer knowledge required of novice users)?				
	Is the novice interface a scaled-down version of a more comprehensive program?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 12 - Query**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is the novice user prompted to select from a list of options, and is an explanation of the options presented?				
	Does the novice interface have a simplified command structure (e.g., fewer, more easily understood commands)?				
	Are mnemonic selections used in preference to numeric?				
	Are intelligent front-end forms and graphics provided for novice users?				
<b>12.6.3 Experienced User</b>					
	Is less detailed on-line information provided for the expert user, to reduce computer overhead?				
	Can the experienced user enter multiple commands to speed the dialog?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 12 - Query

This page intentionally left blank.

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 13 - Embedded Training

M/R -Mandatory/Recommended  
 Y/N - Yes  
 N/A - Not Applicable

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.1 GENERAL</b>					
<b>13.1.1 Initial Use Overview</b>					
	Are first-time users given an overview of the embedded training program?				
	Does this overview convey what is archived by the embedded training by combining both text and graphics (animated or static)?				
<b>13.1.2 Positive User Attitude</b>					
	Does the interface maintain a positive emphasis, <i>not</i> evaluating the user's performance when practicing and experimenting?				
	Does the interface ensure that messages do <i>not</i> blame the user and avoid implying that the computer is human (e.g., "You can use the training program to learn. . ." is preferable to, "The training Program can teach you...")?				
	Are personalized messages avoided?				
	Is the embedded training information accurate?				
	Are personalization (e.g., "Good job, Sam") and personal recognition (e.g., "Excellent!") avoided?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.1.3 Availability of Embedded Training</b>					
	Is the embedded training program available from all points in the application, except during time-critical operations?				
<b>13.1.4 Accuracy of Embedded Training</b>					
	Does the embedded training reflect the most current application; and is training updated in response to changes in the application?				
	Are user's notified when changes are made in application procedures or critical operations?				
	Are users provided with an additional option to see new and revised information (i.e., by selecting "News")?				
<b>13.1.5 Moment of User Need</b>					
	Is training support provided as needed?				
<b>13.1.6 Embedded Training Browsing</b>					
	Can users access and use embedded training, independent of the application?				
<b>13.1.7 Return to the Application From Embedded Training</b>					
	Can users return to the application from any point within embedded training with a single action (e.g., keystroke, command, point and click) without shutting down either system?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 13 - Embedded Training

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.1.8 Application Restore Screen</b>					
	When users exit embedded training, is the application screen restored to its state prior to the request?				
<b>13.1.9 Restore Embedded Training</b>					
	When training is interrupted (e.g., system failure, time-critical requirements) or user exits before completion, can the user choose to resume at the same position in the embedded training?				
<b>13.1.10 Protection From Hazardous or Destructive Actions</b>					
	During embedded training, is the user prohibited from accidentally activating hazardous events (e.g., mine fields) or from destructive control actions (e.g., accidental erasure or memory dump)?				
<b>13.1.11 Application Screen Protection</b>					
	Is the application screen data display <i>not</i> altered or destroyed by embedded training commands?				
<b>13.1.12 Noninterference During Critical Operation</b>					
	In system-initiated embedded training, is the user prohibited from interrupting the primary application during a critical operation?				
<b>13.1.13 Notification of Critical Operation</b>					
	Is the user notified of incoming critical application information (e.g., tactical operation input)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.1.14 Multiple Stations</b>					
	If the system has multiple stations, are stations using embedded training prevented from affecting stations performing operational tasks?				
<b>13.1.15 Context Sensitivity</b>					
	Is the training context-sensitive (i.e., training depends on where the user is in the application or the general nature of the content of the application)?				
<b>13.1.16 Consistent Application Interface</b>					
	Are the application and embedded training interfaces consistent enough to ensure a smooth transition between platforms and to minimize the user's learning requirements (e.g., terminology, displays, commands)?				
<b>13.1.17 Inconsistent Interface Assistance</b>					
	Is assistance provided to the user to overcome interface differences between embedded training and application systems operations?				
	Is assistance provided to the user when the embedded training interface has complex features that might need to be explained?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.2 ADAPTATION TO USERS</b>					
<b>13.2.1 User Control Over Level of Difficulty</b>					
	Are differences in computer experience accommodated by allowing users to select the level and type of assistance (e.g., novice level in some areas, casual operator and/or expert in others)?				
	Can the novice/first-time user select an interface with restricted capabilities that allows only basic feature operation (e.g., in word processing: creating, editing, and printing)?				
	Are novices provided only the necessary information but allowed access to all capabilities by direct request?				
	Are experts offered assistance in more efficiently using the system (e.g., shortcuts, limitations, complex operations)?				
<b>13.2.2 Learning Structure</b>					
	Can users select a type of learning structure [e.g., (1) Discovery - undirected exploring/browsing, (2) Guided/supported discovery - directed exploration, (3) Structured - menu providing explicit options and implicit cues]?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.3 EMBEDDED TRAINING COMPONENTS</b>					
<b>13.3.1 Multiple Components</b>					
	Is multi-component training that is easy to specify and access (e.g., scenarios, information databases, off-line references, common problems, and/or coaching) offered to the user?				
<b>13.3.2 Information Database Component</b>					
	Is an interactive database containing conceptual and task-oriented information provided?				
<b>13.3.3 Reference Component</b>					
	Is a reference component provided that includes all on-line resources and system- and job-related, off-line resources?				
<b>13.3.4 Examples Component</b>					
	Can the user practice using common examples in an exploratory/guided mode?				
	Is experimentation encouraged (i.e., playing "what would happen if...") by allowing the user to exit an application, practice, then return to the unaltered application position?				
	When users explore a problem, is the application protected with an UNDO command requirement?				
	Are the training and application modes clearly distinguished to minimize possible confusion arising from switching back and forth (e.g., highlight or shadow the practice session)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
	Are demonstrations and summary exercises avoided if they do <i>not</i> provide opportunities to practice the procedure or function?				
<b>13.3.5 Advisor or Coaching Component</b>					
	Does embedded training include an "Advice" component that advises and coaches the user in problem-solving?				
<b>13.3.6 Common Errors Component</b>					
	Does the embedded training include a context-similar component that presents common user errors or "Cautions" associated with an approach or task?				
<b>13.3.7 Record Keeping</b>					
	Can the user record the path through a process and/or the training modules completed both successfully and unsuccessfully?				
	Is the privacy of users protected by storing their training records as anonymous files?				
	If the training module will be used for evaluation purposes, are users given prior notification?				
	If the training module will be used for evaluation purposes, are the evaluation criteria explicit?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.4 INSTRUCTIONAL STRUCTURE</b>					
<b>13.4.1 Granularity</b>					
	Are embedded training components structured into "single learning episodes," small and homogeneous enough to be learned as single units?				
	Can users select the particular section or subtopic within a component for which they want assistance?				
<b>13.4.2 System-Controlled Sequences</b>					
	For novice users and for embedded training dealing with critical or hazardous procedures, does the application direct user movement through procedures?				
<b>13.4.3 Sequence Control for Experienced Users</b>					
	Can the experienced user move through the steps of a procedure sequentially or go directly to any specific step or resource point?				
<b>13.5 INSTRUCTIONAL PRESENTATION</b>					
<b>13.5.1 Combined Media Presentation</b>					
	Is a combination of media, graphics, and natural language used where appropriate?				
<b>13.5.2 Graphics for Method-Based Knowledge</b>					
	Do flowchart diagrams provide an overview conveying method-based knowledge consisting of a series of procedural steps and decisions?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.5.3 Reading Requirements</b>					
	Are reading requirements minimized?				
<b>13.5.4 Advance Organization</b>					
	Are cues and overviews provided to orient users unfamiliar with the embedded training content and/or process by briefly describing scenarios, exercises, or courseware outlines?				
	Is a brief statement of the exercise objective provided?				
	Does the brief statement of the exercise objective refer to the primary purpose of the embedded training request?				
	Is each embedded training module clearly identified (i.e., state objective, content, number of subsections, and estimated completion time)?				
	Is the purpose/topic of the request for assistance/HELP used as a cue or title to remind the user?				
<b>13.5.5 Printing</b>					
	Can the user print embedded training content—ranging from screen displays to courseware, information to study further, or for future reference, and/or to print the displayed training material?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.5.6 Fidelity</b>					
	Are the level of training content and presentation clarity adjusted to match the training (i.e., low fidelity for initial training, simple data, and easy process or high fidelity for unusual processes, hazardous events, or difficult processes)?				
<b>13.5.7 Simplicity</b>					
	Are simple answers given to the user's simple questions?				
	If the answer is long or complex, is the user offered a summary and options to request additional guidance?				
<b>13.5.8 Verification</b>					
	Can the user verify or confirm selected options, solutions, and commands?				
<b>13.6 ACCESSING TRAINING</b>					
<b>13.6.1 Displayed Embedded Training Availability</b>					
	Are command, icon, or function keys that access training throughout the application displayed continuously to remind the user of training availability?				
<b>13.6.2 Access Via Training Icons</b>					
	Can the user access embedded training directly by selecting an embedded training icon and moving to the point where assistance is needed?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 13 - Embedded Training

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.6.3 Structured Menu</b>					
	When using a structured menu to access the embedded training, can the user add to or change existing embedded training messages (e.g., add terms to the menu using an ADD function)?				
	If users can customize menus, is the original menu protected (e.g., log-on files for individual users)?				
<b>13.7 SCREEN DISPLAY</b>					
<b>13.7.1 Complete Display</b>					
	Does each screen stand alone, so that users are <i>not</i> required to refer to a previous screen within a module to recall essential information, e.g., identical information entered on a series of screens is automatically updated when information changes, or the user is prompted to record the information?				
<b>13.7.2 Graphics</b>					
	Is the functional objective of the graphic portrayed clearly, and are graphics uncomplicated, omitting nonessential visual detail?				
<b>13.7.3 Window Placement</b>					
	Is the assistance window located such that critical application information (e.g., navigation buttons, operational icons, or status messages) remain visible?				
<b>13.7.4 User Window Control</b>					
	Can the user resize and reposition overlapping windows?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

### Chapter 13 - Embedded Training

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.8 TECHNICAL COMMUNICATION/WRITING STYLE</b>					
	Are embedded training topics, messages, and menu options phrased in the active voice?				
	Are task-related terms phrased to refer to the learning task (e.g., "Creating and modifying fields" instead of "Fields")?				
<b>13.9 MOBILITY/NAVIGATION</b>					
<b>13.9.1 Mobility Within the Embedded Training</b>					
	Can the user move among embedded training components freely without returning to the top of a central hierarchy, exiting the current component, proceeding through a preset path, or stepping through introductory material?				
<b>13.9.2 Embedded Training Navigation Button Display</b>					
	Are embedded training navigation "buttons" displayed in each embedded training screen for controlling movement between and within modules?				
<b>13.10 ERROR FEEDBACK</b>					
<b>13.10.1 Immediate Feedback</b>					
	Is timely feedback provided at the user's level of expertise?				
	For multiple step practice, is immediate feedback provided in order to avoid a series of incorrect actions?				
	For novices and/or uncomplicated problems, is immediate feedback provided (e.g., a suggested next best step)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_



**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.10.2 Context-Similarity Feedback</b>					
	Is feedback provided to users in a form similar to the application, product, or outcome (e.g., an error in equipment setup illustrated by correctly configured equipment rather than by checklist, menu, or even natural language message)?				
<b>13.10.3 Error Identification</b>					
	Does specific feedback identify errors rather than assign a score?				
<b>13.10.4 Tone of Error Message</b>					
	Are error messages constructive and neutral in tone, rather than judgmental of the user (e.g., "the system cannot process. . ." is preferable to "Invalid Number: Entry must be 4 digits. . .")?				
<b>13.10.5 System-Initiated Error Feedback</b>					
	When a response to a system-initiated query or recommended action is required, is an opportunity provided to stop and think (i.e., consider other options, recall experiences, and weigh problem solutions), without premature system interruption?				
	Does the system avoid over-prompting and unwanted problem resolution?				
	Are users offered the ability to place system initiation on hold or cancel an upcoming intervention?				
	Are prompts for novices provided that identify probable next-step errors?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
	Is control blocking used sparingly (e.g., prevent from accidental hazardous or destructive actions)?				
	Can novices select an error-blocking option that limits errors?				
	Can the user temporarily block the system-initiated error feedback or instruction?				
	If the system automatically corrects some errors, is the user notified of corrections (e.g., by a message and highlighting of the corrected information)?				
	Can experienced users select automatic system-error correction without requiring confirmation?				
	Is blocking the access to system functionality avoided?				
	Is user confusion that may result from automatic system error correction avoided?				
<b>13.11 ABILITY TO MODIFY</b>					
<b>13.11.1 Addition to the Embedded Training</b>					
	Can the user add to, but <i>not</i> modify, the original training system?				
	If embedded training allows individual user modifications, is the original application and embedded training protected (e.g., separate log-on files for each user)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Chapter 13 - Embedded Training**

Section	Guideline	M/R	Y/N	N/A	Comments
<b>13.11.2 Multi-User Systems</b>					
	On multi-user systems, can individual users store and reference additions in an individual file for their own use?				
<b>13.11.3 Annotation</b>					
	Can users annotate a copy of the training program (i.e., examples, pitfalls, process notes, references etc.)?				
<b>13.11.4 Annotation Search</b>					
	Can the user search an annotation log?				
<b>13.11.5 Icons Used to Designate Annotations</b>					
	Are icons used to designate the position of an annotation in the embedded training program (e.g., user example, caution, additional reference)?				

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

## Chapter 13 - Embedded Training

This page intentionally left blank.

Date \_\_\_\_\_ Reviewer \_\_\_\_\_

System Name and Version \_\_\_\_\_

**Attachment 2 to Final Report FY96 DISA Tasks**

**DoD TECHNICAL ARCHITECTURE FRAMEWORK  
FOR INFORMATION MANAGEMENT (TAFIM), VOLUME 8**

*U.S. Department of Defense  
Human-Computer Interface Style Guide*

**USER SURVEY**

*on the DoD HCI STYLE GUIDE*

This page intentionally left blank.

## USER SURVEY ON THE DoD HCI STYLE GUIDE

The Pacific Northwest National Laboratory (PNNL) has been providing on-going support in the areas of human-computer interface (HCI) specification and standardization to the Defense Information System Agency (DISA) since 1992. This support has focused primarily on the evolution of the *Department of Defense (DoD) Human-Computer Interface (HCI) Style Guide*, which is Volume 8 of the *Technical Architecture Framework for Information Management (TAFIM)*. As a part of this effort, DISA would like to determine the future direction of Volume 8. In this survey, we would like your opinion on characteristics necessary for HCI style guides.

### PART 1

The following are statements about the content and form of human-computer interface style guidance documents. Please indicate the degree to which you agree with the following statements about the information contained in human-computer interface style guides.

1) Strongly Disagree, 2) Disagree, 3) Neither, 4) Agree, 5) Strongly Agree		Response				
		1	2	3	4	5
1.	Information about human factors principles is needed to support selection of design alternatives.					
2.	Recommended design methodologies guide the user interface design process.					
3.	Graphics are needed to illustrate design principles.					
4.	Domain specific examples are needed to ensure the development of consistent applications.					
5.	Style guide information would be consulted more frequently if it were on-line.					
6.	Detailed information about the look and behavior of user-interface components is needed.					
7.	Design rules are more useful than detailed design guidance to the user interface designer.					
8.	Dynamic examples are needed to improve the application of the guidelines.					
9.	User interface style guide information should be integrated into the programming environment.					
10.	A feedback mechanism is needed to evaluate compliance with the style guide.					

11. Please indicate who you think the principal users of a human-computer interface style guide are:

Check all that apply:

- Human factors engineers
- Systems engineers
- Programmers
- User interface designers
- Program Managers
- Other

12. Will you please list or describe other features that you think are important in human-computer interface style guides?

---

---

---

**PART 2**

If you have used the *DoD HCI Style Guide*, will you please answer the following questions.

1. What is the role of the *DoD HCI Style Guide* in the *TAFIM*?

---

---

---

2. DoD has other style guides ( e.g., the DII or GCCS style guides) for the development of user interfaces for applications. In your opinion, what is the appropriate relationship between these style guides and the *DoD HCI Style Guide*?

---

---

---

3. What is the most appropriate delivery media for the *DoD HCI Style Guide*?

---

---

---

4. Who is the target audience for the *DoD HCI Style Guide*?

---

---

---

5. We would appreciate any other comments that you may have on the format and content of the *DoD HCI Style Guide*.

---

---

---



**Attachment 3 to Final Report FY96 DISA Tasks**

**DoD TECHNICAL ARCHITECTURE FRAMEWORK  
FOR INFORMATION MANAGEMENT (TAFIM), VOLUME 8**

*U.S. Department of Defense  
Human-Computer Interface Style Guide*

**REFERENCE LIST**

This page intentionally left blank.

## REFERENCE LIST

1. Apple Computer, Inc. 1992. *Macintosh Human Interface Guidelines*. Addison-Wesley Publishing Company, Reading, Massachusetts.
2. Microsoft Corporation. 1992. *The Windows™ Interface: An Application Design Guide*. Microsoft Press, Redmond, Washington.
3. Open Software Foundation (OSF). 1992. *OSF/Motif™ Style Guide*, Revision 1.2. Prentice Hall, Englewood Cliffs, New Jersey.
4. Smith, S. L., and J. N. Mosier. 1986. *Guidelines for Designing User Interface Software*. The MITRE Corporation, Bedford, Massachusetts.
5. TriTeal Corporation. 1995. *TriTeal Enterprise Desktop (TED™) 4.0 Style Guide and Certification Checklist*. TriTeal Corporation, Carlsbad, California.
6. U.S. Army Tactical Command and Control Systems Experimentation Site. 1990. *Human Factors Design Guidelines for the Army Tactical Command and Control System (ATTCS) Soldier-Machine Interface, Version 1.0*. Fort Lewis, Washington.
7. U.S. Army Tactical Command and Control Systems Experimentation Site. 1992. *Human Factors Design Guidelines for the Army Tactical Command and Control System (ATTCS) Soldier-Machine Interface, Version 2.0*. Fort Lewis, Washington.
8. U.S. Army Tactical Command and Control Systems Experimentation Site. 1993. *DoD Style Guide 3.0 Design Checklist*. Prepared for the Department of Defense, Defense Information Systems Agency (DISA), Fort Lewis, Washington.
9. U.S. Department of Defense. 1992. *Department of Defense Human Computer Interface Style Guide, Version 1.0*. Defense Information Systems Agency/Center for Information Management, McLean, Virginia.
10. U.S. Department of Defense. 1992. *Department of Defense Human Computer Interface Style Guide, Version 2.0*. Defense Information Systems Agency/Center for Information Management, McLean, Virginia.
11. U.S. Department of Defense. 1993. *Department of Defense Human Computer Interface Style Guide, Version 3.0*. Defense Information Systems Agency/Center for Information Management, McLean, Virginia.

12. U.S. Department of Defense. 1995. *Department of Defense Human Computer Interface Style Guide*, Volume 8 of the *Technical Architecture Framework for Information Management, Version 3.0*. Defense Information Systems Agency, Center for Standards. Washington, DC.
13. U.S. Department of Defense. 1994. *Department of Defense Technical Architecture Framework for Information Management, Version 2.0*. Defense Information Systems Agency, Center for Standards. Washington, DC.
14. U.S. Department of Defense. 1995. *Department of Defense Technical Architecture Framework for Information Management, Version 3.0*. Defense Information Systems Agency, Center for Standards. Washington, DC.
15. U.S. Department of Defense. 1996. *User Interface Specifications for the Defense Information Infrastructure (DII), Version 2.0*. Defense Information Systems Agency, Joint Interoperability and Engineering Organization. Washington, DC