DATA ITEM DESCRIPTION

Title: **Interface Specification**

Number: DI-SESS-81632   **Approval Date:** 20020308
AMSC Number: F7475   **Limitation:** N/A
DTIC Applicable: No   **GIDEP Applicable:** No
Preparing Activity: F/10
Applicable Forms: None

Use/Relationship:

   The Interface Specification (IS) contains the requirements and design for controlled interfaces between systems and system components, facilities, or agencies, down to any detail level such as system segments, prime items, computer software configuration items, and hardware configuration items. The purpose of the IS is to specify interfaces for functional-, allocated-, and product-level configuration baselines. The IS is the tool by which the government communicates and controls an interface's requirements and design. The IS references interface information contained in a Common Interface Specification (CIS) which is prepared when the requirements and design for controlled interfaces are common to two or more systems, facilities, or agencies. Upon government authentication, the documents prepared with this DID become part of the government-controlled configuration baseline. The IS and CIS are useful to the contractor(s) as the basis for the design, development, and maintenance of the interfaces(s).

   This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract SOW.

   This DID does not require any other DID types, nor is it mutually exclusive with any DID types.

Requirements:

1. Referenced Documents. The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as cited in the current issue of the DODISS at the time of solicitation; or, for non DODISS-listed documents, as stated within.   Referenced documents include the following:

        a. Interface Development and Support Engineering (IDSE) Aerospace TOR-009 (6488-04)-2 Reissue A

        b. IDSE Aerospace TOR-91 (6488-04)-1 Reissue A.

1.1 The address for obtaining the IDSE documents is:

                USAF Space and Missile Systems Center
                SMC/CWXC
                155 Discoverer Blvd., Suite 1062
                Los Angeles AFB, CA 90245-4692

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2. Format. The IS and CIS will be in the following format, if acceptable contractor or other format is not available. The following exceptions apply to contractor or other formats:

2.1 Page Numbering/Labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

2.2 Paragraph Numbering. Paragraphs shall be numbered in accordance with the directions in section 3 of this DID. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

3. Content. (The use of "IS" also applies to "CIS" in this section.)

3.1 Front matter. Each volume shall have a Cover Page, an Approval/Authentication page and, if applicable, other front pages. The cover page shall contain the IS title, document identifier, date, contract number, volume number, revision indicator, revision date, CDRL sequence number, distribution notification, destruction notice as required by contract, procuring organization name, procuring organization address, prepared-by organization name, and prepared-by organization address. The Approval/Authentication page shall include the document identifier, date, volume number, revision indicator and date if revised, interfacing item names, contract number, CDRL sequence number, prepared for organization, prepared-by organization, approving signature (preparer name, organization, and title), and authentication signatures with procuring and interfacing organization names and dates. Other front pages can include forewords, acknowledgments, and instructions to reviewers for draft versions.

3.2 Table Of Contents. The IS shall contain a table of contents providing the number, title, and page number of the titled paragraph and subsequent appendices to a level adequate to assist the reader in locating the desired information. Each paragraph of the IS need not be included. The IS shall contain the number, title, and page number for each figure and table presented. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

3.3 Introduction. Number this section as 1.0. It shall contain only non-specifying (explanations and background) statements and shall be divided into the following paragraphs.

3.3.1 Overview. Number this paragraph as 1.1. This paragraph shall state any useful introductory information about the IS. Examples include purpose, why the IS is being written at the current time, historical background information, and any other information not captured elsewhere in the IS. The introduction shall be a brief textual paragraph and shall not contain any figures or tables.

3.3.2 Related Documents and Data. Number this paragraph as 1.2. This paragraph shall capture the relationship with other documents. The intention is to make the reader aware of the bigger picture and how this IS fits into this picture; however, include only those related items from which requirements were derived or that may need to be referenced by a reader. Documents listed here are not required to be identified in Section 2 of the IS, Referenced Documents, unless they are also referenced in Section 3, Interface Requirements. ECPs, drawings, and the like would only be listed here. The following are examples of related documents and data and other items to consider when addressing the relationships to other documents and data:

a. *Relationship to other ISs and CISs* - Is this IS related to other ISs or CISs?

b. *Engineering Change Proposals (ECPs)* - Identify modification used to provide this capability and interface for historical purposes.

c. *Interface Control Drawings (ICDs)* - What other documents were used in the generation of this IS? Drawings and other diagrams may be all that were generated for the original implementation.

d. *Superseded documents or predecessor documents* - Does this IS supersede other documents? What was the reason for creating this IS?

3.3.3 Interface Scope. Number this paragraph as 1.3. It introduces the reader to details given in Section 3 of the IS, and shall be divided into the following subparagraphs.

3.3.3.1 System Summary. Number this paragraph as 1.3.1. It shall briefly describe how the interface or interfaces fit in the system(s). An accompanying diagram(s) should depict the system(s) within which the interface(s) fits. The description and accompanying diagram(s) should help the reader visualize the system(s) into which the interface fits. If the IS contains multiple levels of interfaces, this paragraph need only describe the top-level interfaces.

3.3.3.2 Interface Boundaries. Number this paragraph as 1.3.2. It shall briefly describe the location and organizational responsibilities (which organization is responsible on each side) at the interface boundary of the interfaces described in this IS. Organizations identified here should be government organizations, not contractor organizations, unless the interface involves a contractor-owned system or facility. An accompanying diagram(s) shall show the precise boundary of the interface(s). Each interface shall have only one boundary. However, each interface may be documented at different baseline levels as well as at different Open Systems Interconnection Reference Model (OSIRM) layers. The boundary line shall appear close to one of the items, not in the middle, to clearly represent which item includes the connection between the two items. If this IS contains multiple levels of interfaces, this paragraph (and accompanying diagram) needs to describe only the top-level interfaces; however, in this case, the precise boundary of subordinate interfaces shall be described and depicted in Section 3 of the IS.

3.3.3.3   Layered Interface Definition (LID). Number this paragraph as 1.3.3. A compressed layered interface definition (LID) may be used in lieu of the OSIRM. This paragraph shall briefly introduce the reader to how the LID maps to the seven-layer OSIRM and is used to describe the interfaces in this IS. This paragraph shall only contain introductory information; if additional explanation of the LID is necessary the IS shall contain a LID tutorial in paragraph 5.2 of the IS, Tutorials and Explanations. This paragraph shall also contain a figure denoting the LID layers that apply to interfaces within the scope of the IS. This paragraph may begin with the following text as appropriate.

"The interfaces in this document may be of two types: informational (INFO) or non-information (Non-INFO). INFO interfaces define the characteristics necessary to transfer information electronically. Non-INFO interfaces define the characteristics necessary to support the information transfer."

3.3.3.4 Configuration Item (CI) Relationships. Number this paragraph as 1.3.4. This paragraph shall briefly describe the CIs dependent upon or affected by the interfaces in this document. It identifies the relationship between this IS and the interfaces contained herein with the specifications and CIs of the interfacing systems. An interface CI Relationship Table shall list the affected CIs and related interfaces. The table should include the interface group/individual names

as identified in the previous sections and the affected specifications/CIs. The CIs identified are not only the ones physically connected (HWCI and facilities) but also logically connected (CSCI). The purpose of identifying these CIs is to identify any interfaces which may be potentially impacted when a particular CI is modified.

3.3.4 Security. Number this paragraph as 1.4. This paragraph shall state the following:

"There are safeguards in place that adequately protect the [system name]. These safeguards are based upon validated threats to [mission/system name] mission resources and known vulnerabilities inherent in those resources as outlined in the [mission/program name] Operational Requirements Document. Security safeguards minimize or eliminate the effects of national security compromises that could result from the unauthorized disclosure of Classified or Sensitive But Unclassified (SBU) information or from the unauthorized modification or destruction of system resources or information. These safeguards also mitigate any adverse impacts resulting from the denial of system services, resources, or data."

3.4 Referenced Documents. Number this section as 2. It shall be divided into the following paragraphs to list documents cited in Section 3 of the IS. Subordinate paragraphs may be used to contain the document lists of this section. Each document listed in this section shall have at least a document identifier and a document title.

3.4.1 Government Documents. Number this paragraph as 2.1. This paragraph shall begin with one of the following two phrases:

a. "The following documents of the exact issue shown form a part of this IS to the extent specified in Section 3. In the event of conflict between the documents referenced herein and the contents of this IS, the contents of this IS shall be considered a superseding requirement."

b. "The following documents of the exact issue shown form a part of this IS to the extent specified in Section 3. In the event of conflict between the documents referenced herein and the contents of this IS, the contents of this IS shall be considered the superseding requirement, except for the documents listed below."

3.4.1.1 If the phrase "b" above is selected, a list of the next higher-tiered specifications that supersede the IS shall immediately follow the paragraph.

3.4.1.2 Government document copy instructions. The following paragraph shall appear after the list of Government documents:

"Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the contracting agency or as directed by the contracting officer."

3.4.1.3 Government document order. Government documents shall be listed by document number and title in the following order:

SPECIFICATIONS: Federal, Military, Other Government Agency

STANDARDS: Federal, Military, Other Government Agency

DRAWINGS: (Where detailed drawings referred to in a specification are listed on an assembly drawing, it is only necessary to list the assembly drawing.)

OTHER PUBLICATIONS: Manuals, Regulations, Handbooks, Bulletins, et. al.

3.4.2 Non-Government Documents. Number this paragraph as 2.2. It shall begin with the following:

"The following documents of the exact issue shown form a part of this IS to the extent specified in Section 3. In the event of conflict between the documents referenced herein and the contents of this IS, the contents of this IS shall be considered a superseding requirement."

3.4.2.1 Non-Government copy instructions. The source for any documents not available through normal Government stocking activities shall be listed. The following paragraph shall be placed at the conclusion of the list when applicable:

"Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal Agencies."

3.4.2.2 Non-Government document order. Non-Government documents shall be listed by document number and title in the following order: SPECIFICATIONS, STANDARDS, DRAWINGS, OTHER PUBLICATIONS.

3.5 Interface Requirements and Design. Number this section as 3. It shall be divided into the following paragraphs and subordinate paragraphs that define the interfaces. The purpose of this section is to contain specifying data (e.g., technical requirements, security requirements, standards compliance information, interface designs, etc.); however, it may also contain non-specifying data when it is essential to understanding the specifying data. It is important that the subparagraphs of Section 3 of the IS contain minimal non-specifying data. Section 5, Notes, has been provided for tutorial, explanatory, and other non-specifying data.

        a. Section 3 of the IS shall contain interface-identifying data in tabular format summarizing the interfaces covered in the following sections. The table and subsections in this section shall be organized similarly with regard to interface groups and individual interfaces. Explanatory text may be added as appropriate. The table shall contain the interface group and individual interface names/nicknames, applicable configuration baseline-levels, interface types, and applicable OSIRM/layered interface definition layers.

        b. Allowable denotation for the configuration baseline-levels are: functional, allocated, and product.

        c. Each interface shall be classified as either INFO or non-INFO. Interfaces classified as INFO shall be specified in accordance with the structure and contents specified in paragraph 3.5.1 of the this DID and its subordinate paragraphs. Interfaces classified as non-INFO shall be specified in accordance with paragraph 3.5.2 and its subordinate paragraphs.

3.5.1 INFO Interfaces. Number this as paragraph 3.1. Each INFO interface group [IFgroup] shall be described in a separate paragraph numbered 3.1.x (where x is unique and in sequential order for each INFO group), titled with "INFO interfaces: [IFgroup]". This paragraph shall contain a set

of INFO interfaces that belong to the group. The most frequent type of group is the name of a higher configuration baseline-level interface. This allows the author to indicate which interfaces belong together. "[IFgroup]" shall be replaced by text that helps describe the interfaces listed under this heading. If the IS contains only one interface, it is an interface group of one and the same paragraph structure shall be maintained to allow for future expansion and document consistency. In this instance the same name may be used for the [IFGroup] and [IFnickNm]. If there are no INFO interfaces, state that this paragraph is not applicable.

3.5.1.1 Summary. Each INFO interface group shall have a paragraph numbered 3.1.x.1 (where x is the same number as its parent paragraph) and titled "Summary." This paragraph shall contain introductory and summary information about the interface group. Normally the statements in this paragraph do not contain requirements. This paragraph shall state the purpose of the interfaces in this group and generally describe how these interfaces interrelate, and how they relate to other interface groups, especially other interface groups inside the IS. This paragraph may also state introductory material for the requirements or design. An example of this type of material is general statements about the developmental maturity of the interfaces in this group.

3.5.1.2 [CbLevel]-Level, [IFnickNm]. Each INFO interface group shall have a paragraph numbered 3.1.x.y (where x is from the parent paragraph and y is a unique, sequential number starting with "2)," titled "[CbLevel]-level, [IFnickNm]". It shall specify the requirements and design for one configuration baseline-level of the [IFnickNm] interface.

3.5.1.2.1 Each interface description paragraph shall be classified as one of the [CbLevel] (configuration baseline-levels): "functional," "allocated," or "product." No abbreviations shall be used for these terms in the title. The paragraph title shall indicate the interface's configuration baseline-level that is described in this paragraph. The contractor may present configuration baseline-level information in separate documents where it facilitates configuration management of the interface information.

3.5.1.2.2 Each subparagraph shall be numbered 3.1.x.y.z, where x and y are the numbers from their parent paragraphs and z is a paragraph corresponding to a layer in the OSIRM or the LID defined in paragraph 5.2 of the IS. The following subparagraphs illustrate paragraph structure for presenting layer dependent interface information.

3.5.1.2.2.1 Interprocess Layer. This paragraph may be numbered 3.1.x.y.1 (where x and y are the numbers from their parent paragraphs) and titled "Interprocess layer." Its contents shall be in accordance with the description of this layer outlined in paragraph 5.2 of the IS.

3.5.1.2.2.2 Interpretation Layer. This paragraph may be numbered 3.1.x.y.2 (where x and y are the numbers from their parent paragraphs) and titled "Interpretative layer." Its contents shall be in accordance with the description of this layer outlined in paragraph 5.2 of the IS.

3.5.1.2.2.3 Path Layer. This paragraph may be numbered 3.1.x.y.3 (where x and y are the numbers from their parent paragraphs) and titled "Path layer." Its contents shall be in accordance with the description of this layer outlined in paragraph 5.2 of the IS.

3.5.1.2.2.4 Link Layer. This paragraph may be numbered 3.1.x.y.4 (where x and y are the numbers from their parent paragraphs) and titled "Link layer." Its contents shall be in accordance with the description of this layer outlined in paragraph 5.2 of the IS.

3.5.1.2.2.5 Unlayered. This paragraph may be numbered 3.1.x.y.5 (where x and y are the numbers from their parent paragraphs) and titled "Unlayered ." Its contents shall be in accordance with the description of this layer outlined in paragraph 5.2 of the IS.

3.5.2 Non-INFO Interfaces. Number this as paragraph 3.2. Each Non-INFO interface group [IFgroup] shall be described in a separate paragraph numbered 3.x (where x is unique and in sequential order for each non-INFO interface group), titled with "Non-INFO interfaces: [IFgroup]". This paragraph shall contain a set of non-INFO interfaces that belong to the group. The most frequent type of group is the name of a higher configuration baseline-level interface. This allows the author to indicate which interfaces belong together. "[IFgroup]" shall be replaced by text that helps describe the interfaces listed under this heading. If there are no non-INFO interfaces, state that this paragraph is not applicable.

3.5.2.1 Summary. Each Non-INFO interface group shall have a paragraph numbered 3.2.x.1 (where x is the same number as its parent paragraph) and titled "Summary." This paragraph shall contain introductory and summary information about the interface group. Normally the statements in this paragraph do not contain requirements. This paragraph shall state the purpose of the interfaces in this group and generally describe how these interfaces interrelate and how they relate to other interface groups; especially other interface groups inside the IS. This paragraph may also state introductory material for the requirements or design. An example of this type of material is general statements about the developmental maturity of the interfaces in this group.

3.5.2.2 [CbLevel]-Level, [IFnickNm], [IFtype]. Each Non-INFO interface group shall have a paragraph numbered 3.2.x.y (where x is a number from the parent paragraph, and y is a unique, sequential number starting with 2), titled "[CbLevel]-level, [IFnickNm], [IFtype]". It shall specify the requirements and design of one configuration baseline-level of the [IFnickNm] interface. If a single interface has multiple configuration baseline-levels, each level shall have a separate paragraph.

3.5.2.2.1 Each interface shall be classified as one of the [CbLevel] (configuration baseline-levels): "functional," "allocated," or "product." No abbreviations for these terms shall be used in the title. The paragraph title shall indicate the interface's configuration baseline-level that is described in this paragraph. The contractor may present configuration baseline-level information in separate documents where it facilitates configuration management of the interface information.

3.5.2.2.2 Each non-INFO interface shall be classified as one of the following interface types [IFtype]: electronic, electrical power, pneumatic, hydraulic, mechanical, environmental, safety, security or other. Each subparagraph shall be numbered 3.2.x.y.z and titled to correspond to the applicable interface types.

3.6 Quality Assurance Provisions. Number this as section 4. It shall contain verification requirements for the interfaces of this specification and shall be compliant with the guidelines set forth in Quality Assurance section of the system functional specification. This section shall be broken into the following two paragraphs.

3.6.1 Summary. Number this as paragraph 4.1. It shall explain the methods of verification necessary to fully satisfy the interface requirements as stated in Section 3 of the IS. Also, in the case of an IS, any tailoring of the Verification Cross-Reference Matrix found in an associated CIS shall be briefly noted here.

3.6.2 Verification Cross-Reference Matrix (VCRM). Number this as paragraph 4.2. The quality assurance requirements documented in the VCRM shall be directly associated with the

requirements contained in Section 3 of the interface document and is intended to be a verification requirements guide to the potential user of the interfaced system.   The listed methods are the minimum standards that the user must meet to satisfy the interface verification requirements. The VCRM shall contain each supported requirement, the associated paragraph number, the method(s) of verification (if applicable) and a brief comment/remark about the requirement and method of verification.

3.7. Notes. Number this as section 5. It shall contain any general data that aids in understanding and using the IS. This section shall not contain any requirement statements. Any material placed in this section may alternatively be placed in an appendix. In this case, the appendix shall be referenced here. If an IS does not have any content in this section, the word "None" shall be placed in this section heading.

3.7.1 Definitions and Acronyms/Abbreviations. Number this as paragraph 5.1. This paragraph shall be divided into the following two paragraphs:

3.7.1.1 Definitions. Number this as paragraph 5.1.1. It shall list the significant terms and their definitions that are used in the IS.

3.7.1.2 Acronyms/Abbreviations. Number this as paragraph 5.1.2. It shall list all acronyms and abbreviations along with their meanings as used in the IS.

3.7.2 Tutorials and Explanations. Number this as paragraph 5.2. It shall contain explanatory material to help the reader understand any subject pertinent to the interfaces specified in the IS. For example, a tutorial about Layered Interface Definition (LID) or the Configuration baseline-levels shall be placed here.

3.8 Appendices. Appendices shall be lettered alphabetically. Paragraphs within appendices shall be numbered in a similar manner as the main body of the IS (e.g., the first paragraph in Appendix A will be identified as A.1; the second paragraph in Appendix B will be identified as B.2 with subsequent subparagraphs identified as B.2.1, B.2.2, etc.). Page numbering will be similar. The first page of Appendix A shall be numbered as A-1, the second as A-2, and so on. The same numbering scheme shall be used for each successive appendix.

3.8.1 Appendices may be used to provide additional data or information published separately for convenience in document maintenance and handling (e.g. classified data). Appendices shall be referenced from the main body of the IS where the data would normally have been provided. Appendices may be bound as separate documents for ease in handling. In such cases the IS is a multi-volume document and must conform to the requirements of paragraph 3.1 of this DID.

3.8.2 Appendix - Requirements Traceability Matrix (RTM). This appendix, if included, shall be titled "Requirements Traceability Matrix (RTM)," and shall contain the requirements traceability matrix for the IS. A reference (using a pointing detail) to a document that has a RTM that covers this document is also acceptable.

3.8.2.1 The RTM entries shall consist of references to details for interrelated requirements and design statements in the IS. The RTM must cover the same requirements as the VCRM. Reference Section 3.6.3 of this DID. The RTM entries should consist of references to details (paragraphs, or the equivalent of IS details) in other documents, but shall reference external documents as a whole if the external documents are not baselined.

3.8.2.2 The RTM entries shall contain the interface requirement identifier [DetailID] and the requirement source [DetailSrc]. The RTM may also contain the paragraph number of the interface requirement and a brief description of the requirement. The requirement source [DetailSrc] should cite a specific document (specific paragraph is optional) from which the interface requirement [DetailID] was taken or derived.

4. General Instructions.

4.1 Response To Tailoring Instructions. If a paragraph is tailored out of this DID, IS/CIS shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

4.2 Standard Data Descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

4.3 Substitution of Existing Documents. Commercial or other existing documents may be substituted or referenced for any part of the IS/CIS if they contain the required data.

4.4 Alternate Presentation Styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

5. Media. Use of automated techniques is encouraged. The terms "document" or "specification" in this DID mean a collection of data regardless of its medium.

6. End of DI-SESS-81632