AEROSPACE REPORT NO.
TOR-2006(8506)-5738

Recommended Software-Related Contract Deliverables for National Security Space System Programs

14 February 2008

Karen L. Owens and Joanne M. Tagami
Software Acquisition and Process Department
Software Engineering Subdivision

Prepared for:

Space and Missile Systems Center
Air Force Space Command
483 N. Aviation Blvd.
El Segundo, CA 90245-2808

Contract No. FA8802-04-C-0001

Authorized by: Systems Planning and Engineering Group

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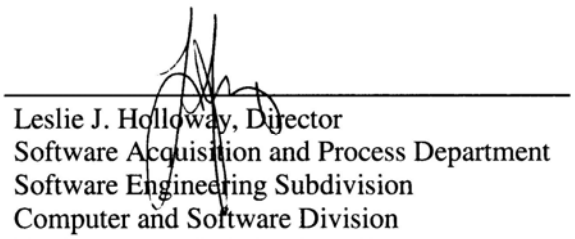

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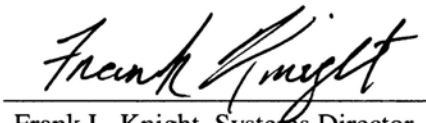

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Abstract

This report was prepared in order to provide current best practices for software and software-related Contract Deliverable Requirements List (CDRL) items for a Request for Proposal (RFP). It provides the rationale for requiring these CDRL items as deliverables on contracts, the list of recommended software and software-related system level CDRL items, the purpose and justification of each of these software CDRL items, the timing of these CDRL items with respect to major program milestones, and the identification and tailoring of the Data Item Descriptions (DIDs) used for each software CDRL item. It provides DD 1423-1 forms that can be customized to reflect specific program requirements for use on contracts.

These CDRL items are recommended as contract deliverables for all space, ground, and user equipment systems for National Security Space programs. With additional tailoring, they could apply to other systems as well. Putting these CDRL items on contract is one step in systems engineering revitalization efforts to ensure mission success.

Acknowledgements

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Lastly, the authors wish to thank the many past and present programs that have provided the experience necessary to develop a reasonable set of software-related deliverables for software-intensive systems.

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1. Why Require Software Deliverable Items

"Those who cannot remember the past are condemned to repeat it."
George Santayana (1863–1952)

1.1 Introduction

There is a natural set of products that are generated as a result of executing a structured, mature software development process. A reasonable subset of these software-related products should be required as deliverable items. The Government can balance contractor effort by requiring only the most important software-related products to be delivered and allowing Government electronic access to, but not formal delivery of, the other software-related products. Specifying a product as a deliverable item enforces the importance of that particular product. This document provides the recommended set of important software-related deliverables.

The exact delivery requirements of all products developed by the contractor for formal delivery to the Government are specified in the Contract Data Requirements List (CDRL) within the Request for Proposal (RFP) and the contract. The products on this list are commonly known as CDRL items or data items. For each CDRL item, the Government specifies to the contractor what data (information) is required and when the item is to be delivered.

This section provides brief summaries of past software acquisition practices with their effects on CDRL items, explains the rationale for requiring software CDRL items, explains some misconceptions about software CDRL items, and ends with some conclusions. This section includes:

- Background
  - Pre-Acquisition Reform: The Legacy of the DOD-STD-2167 Era
  - Acquisition Reform
  - Post-Acquisition Reform
- Rationale for Software-Related Contract Deliverables
- Conclusions

1.2 Background

This section summarizes acquisition practices, their effects on software-related CDRL items, and the resulting impact on programs.

1.2.1 Pre-Acquisition Reform: The Legacy of the DOD-STD-2167 Era

During the 1980s, Government Department of Defense (DoD) contracts for software-intensive systems required adherence to a rigid, document-driven, single-pass waterfall model as specified in Military Standard Defense System Software Development, DOD-STD-2167A. The use of this standard, in its entirety without any tailoring to fit the applicability to the program, imposed the production and delivery of numerous and sometimes extraneous software-related CDRL items.

Much time, money, and effort were consumed meeting data content and formatting requirements in order to deliver these products as CDRL items. This experience resulted in CDRL items gaining a general reputation as being too many and too costly.

In Figure 1-1, the pendulum at the far left depicts the use of DOD-STD-2167 and DOD-STD-2167A with the production and formal delivery of many CDRL items.

Lesson Learned: Select and tailor the standards and CDRL contents appropriately for the specific program.

1.2.2 Acquisition Reform

In the 1990s during a period known as Acquisition Reform, the extreme opposite occurred when contractors were given Total System Performance Responsibility (TSPR). Essentially TSPR, an acquisition approach, transferred Government responsibility and tasks to the contractor in order to gain efficiencies and reduce costs by utilizing a contractor's overall management approach and commercial practices with minimal Government oversight. There were reduced requirements for document production and formal delivery of the products. Thus, few, if any, CDRL items were specified on contracts.

Because few CDRL items were required, few software documents were written. Furthermore, these documents were not available in a timely manner. With TSPR, the Government had much less authority to require improved documentation when the products lacked necessary content. Deficient documentation (incomplete, missing, poor quality) led to late, inadequate systems needing rework to improve the systems enough that they could be fielded. This experience left the Government without the necessary insight of the products, their quality, and overall progress.

In Figure 1-1 the pendulum at the far right depicts development with TSPR and very few CDRL items.

Lesson Learned: Having too few CDRL items provides inadequate insight and oversight.

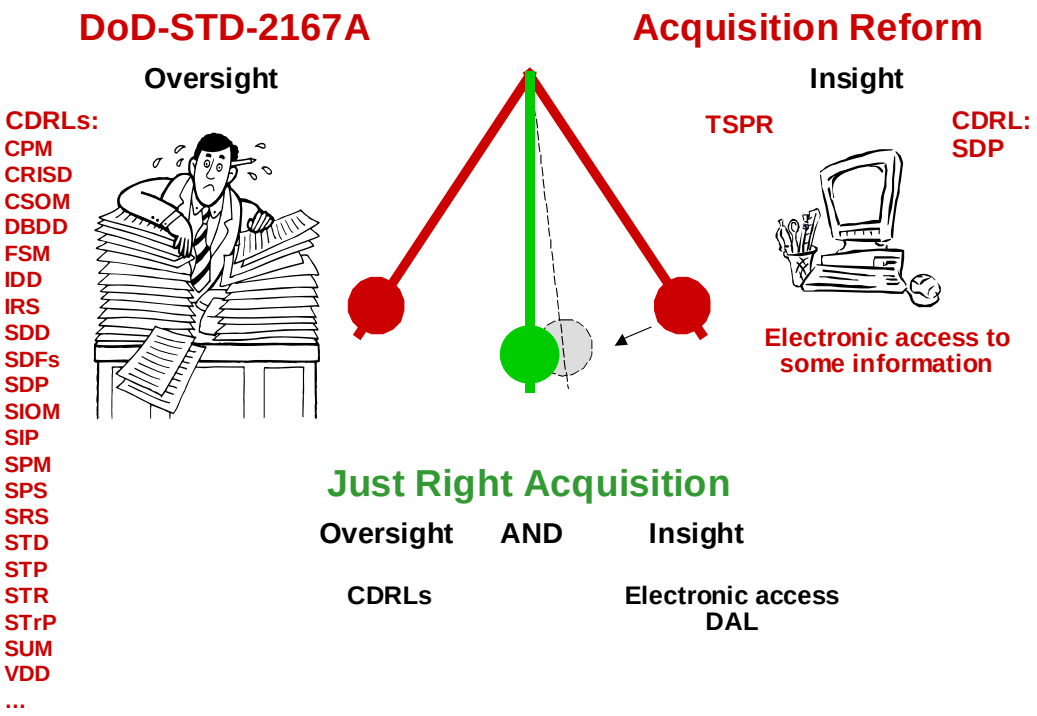
1.2.3 Post Acquisition Reform

With the demise of Acquisition Reform, the objective now is to have an appropriate set of software-related CDRL items for effective Government insight and oversight of the products and the overall program progress. The Government needs oversight of the CDRL products and program progress as well as insight into the other products through electronic access. The Government needs to participate with the contractor to achieve insight and oversight.

The goal now is to have a reasonable set of CDRL items to:
- provide oversight through review and approval of those deliverable products, and
- reinforce the importance of specific products.

The Government needs to achieve insight through:
- participation with the contractor, and
- review of non-deliverable products through electronic access.

Figure 1-1: Software Deliverable Pendulum



1.3 Rationale for Software-Related Contract Deliverables

The recommended set of software-related CDRL items reinforces (from the Government perspective) and reflects (from the contractor perspective) the products developed by using mature software engineering and development processes. Requiring these CDRL items reinforces to contractors the Government's serious commitment to mature software engineering and development processes. In addition, it is recommended that the "*Software Development Standard for Space Systems*," Aerospace Report No. TOR-2004(3909)-3537 [**SWDevStd**] be required as a compliance document on all space program contracts. The development standard defines a set of software activities and resulting software products suitable for the development of space systems. The standard specifies a list of Data Item Descriptions (DIDs) and templates for the software products. These DIDs contain detailed minimum content for complete products such as plans, requirements, architecture, design, reports, and test documentation. Requiring these products as CDRL items also complements the standard, since the standard requires the products to be developed. Requiring the customized DID content for each CDRL item ensures that the product will be complete.

Having software-related CDRL items formally delivered to the Government usually results in contractor management requiring a more comprehensive internal technical review of the items before the signature and data management processes leading to formal delivery. This technical review is beneficial to the Government and to the contractor since products are typically improved and of higher quality as a result of a review cycle. There is a relatively negligible cost impact to provide these products as deliverable items, and the improved quality products pay off

in fewer problems downstream. Contractor format is acceptable instead of a more costly prescribed format. In contrast, the items on the Data Accession List (DAL) and Electronic Data Interchange Network (EDIN) often arrive late and have not necessarily been checked for completeness and correctness.

The minimum set of recommended software-related CDRL items listed in **Section 4** adequately provides the Government with an acceptable level of insight into a program's software development effort. Government review provides early insight into the planned software development processes and products, before and during contract execution. This Government review allows issues and errors to be resolved early, when changes are less costly, rather than later in the program's life cycle, when changes are more costly. When issues and errors are addressed early, defect propagation is reduced.

The quality of products indicates the quality of the process as well as the adequacy of engineering effort being expended. Thus, requiring CDRL items reinforces the requirements for effective software engineering and development processes, and for orderly completion and delivery of products. The products provide insight to determine that effectiveness. From the content provided in the CDRL items and from CDRL item approval authority, the Government has the leverage to influence plans, activities, products, etc. and to address shortcomings.

The set of recommended CDRL items balances the need for adequate development and maintenance information with the need to reduce the total cost of ownership over the life of the program. Critical software CDRL items including all software planning documents, requirements specifications, test plans, and periodic metrics reports require special review attention. Note that every detail of each CDRL item does not have to be scrutinized. Only the critical portions of each deliverable need to be thoroughly reviewed to the depth needed for their criticality, and the rest should be reviewed for maturity and reasonableness. This means that an adequate review of the recommended set of CDRL items can be performed with limited Government team resources.

1.4 Conclusions

Software CDRL items are the normal work products of good software engineering and development processes. They are not produced solely to satisfy Government data requirements. If these software-related products were not required as CDRL items, there would still be an expectation that the contractors would produce these products. However, decades of lessons learned have shown not to rely on the contractors to produce the products and to make them available to the Government without requiring them as CDRL items. Contractors have recently stated that the documents that should be the by-products of mature software processes will not be produced unless they are CDRL items. Requiring these products as deliverables provides a significant risk reduction mechanism at a reasonable cost and is more likely to lead to a successful program. See Software Acquisition and Software Engineering Best Practices [**SAEBestPrc**] for more information.

Lessons learned from the past show that 1) if there are too few contract deliverables, the program may not have adequate insight to perform the oversight role and 2) if there are too many contract deliverables, the program may not be cost-effective. The guiding principle is to require delivery

of only those software products with the highest risk reduction potential. Other software products (such as the detailed design) can be obtained via electronic access to all of the contractor products generated during development.

Table 1-1: Summary of Reasons for Requiring CDRL Items

Requiring a reasonable set of software-related contract deliverables (i.e., CDRL items) provides overall risk reduction through:

- reinforcing mature software engineering and development processes,
- providing more thorough contractor and Government review of products,
- providing Government insight into the planned processes and the resulting products, and
- providing leverage for the Government to influence plans, activities, products, etc. and to address shortcomings through approval of CDRL items.

2. Overall CDRL Item Process for the RFP

This section provides the overall process for determining and tailoring CDRL items before the RFP release. The other sections provide more details on these topics.

2.1 Terminology Conventions

This document generally uses the subtitle of the CDRL item and uses both the Data Item Description (DID) title and subtitle within the 1423 forms. For example "Interface Requirements Specification" is the name of the Data Item Description, but the subtitle is "Interface Requirements Specification – External (IRS-E)". See **Tables 2.7-1 and 2.7-2,** Master CDRL List Examples, for some other examples. The term "System/Segment" is used within the body of this document instead of the older term "System/Subsystem" since a segment is the next level below system. See **Section 4** for an explanation of levels. <Yellow Highlights between angle brackets indicate places to make substitutions for the specific program>.

The "system" terminology is oriented to the contract being at the system level with segments as part of the contract. <System> is used for the top level of the contract and is used for the next level of the same contract. The wording may have to be adjusted to match the contract situation. For example, if the contract is for a ground segment, replace <System> with "Segment" and replace with "Element", respectively. If the contract is for a space segment, change the terms to "Segment" and "Subsystem", respectively. If the contract is for a system that is part of a system of systems, make the appropriate changes. These terms are in <yellow highlighted text within angle brackets> so that it is easier to identify the places that need this adjustment. If the contract is for the system, segments, elements, and subsystems, then all four of those terms may need to be substituted.

2.2 CDRL Item Identification and Justification

Each program has a Data Call to determine which CDRL items to require as part of the RFP. An initial list of potential CDRL items is created. Each potential CDRL item needs a justification, including a list of reasons for including the CDRL item and a list of consequences of not having the product as a CDRL item. Justifications are discussed, and example justifications are provided in **Section 9**. Once the CDRL items have been accepted, then tailoring needs to be done for those accepted.

There will be several iterations of the Data Call cycle; therefore elapsed time and effort must be planned for these iterations. The Data Management personnel will incorporate the provided justification information into the tools they use. It is vital to review the output from the tool to ensure that no omissions or editing errors occurred.

By the time the detailed RFP preparations begin, there should be an approved acquisition strategy, a budget, and a schedule. The System Program Office (SPO) writes a Statement of Work (SOW), or a Statement of Objectives (SOO), or both. Part of the justification of each CDRL must tie the CDRL to a statement in the SOW, SOO, both, or to some other requirement.

This is provided in the Contract Reference block (Block E) of the CDRL item form. Multiple requirements can be referenced. The justifications provided in this document are in table format suitable for charts, which are easier to review with the Program Office personnel for making decisions.

Please contact the software acquisition experts for assistance with identifying, justifying, and tailoring software-related CDRL items for the particular program. See **Section 13**, Resources.

2.3 Data Item Descriptions (DIDs) and CDRL Item Tailoring

Military and commercial Data Item Descriptions (DIDs) specify the default information that is required for most work products. The DIDs are identified in **Section 6**, CDRL Data Item Description (DID) Identifiers. The DIDs are obtained following the instructions in **Section 13**, Resources. The Resources section also has information on obtaining the forms for the CDRL item justifications and forms for the CDRL item tailoring.

The Government reviews the proposed CDRL items to determine which ones apply to the program. After the program staff has agreed on the CDRL items, there is a formal Data Requirements Review Board (DRRB) to baseline the list of CDRL items. After determining which CDRL items to require on the program, the tailoring for the program is performed.

Most of the DIDs referenced for CDRL items need to be tailored to incorporate current software practices and to adapt them for the specific program. The CDRL item tailoring shown in **Section 10** includes only the generic tailoring to bring the product requirements up to current practices. Tailoring for a particular program often also needs to be performed.

In tailoring, DID content is replaced or deleted to suit the needs of a program and to reduce unnecessary costs. Tailoring may also explain the DID content and provide interpretation of the content for the specific program. The delivery timing for each contract deliverable is also specified. For each CDRL item, forms are used to justify the CDRL item and to specify the tailoring of the DID, refer to any standard tailoring for the specific program, and to specify any other requirements (e.g., approval). The completed CDRL item form specifies the tailored DID or template content for a single CDRL item, its delivery timing, and other information for the program. The collection of CDRL item forms is referred to as the CDRL package (Exhibit A) of the RFP package.

Additional information on tailoring the DIDs and related standards is provided in **Section 3**, Data Item Description (DID) and Standards Tailoring.

2.4 CDRL Item Approval

Some CDRL items require Government approval and a very small set require authentication. Block 8 of the Form 1423 used by the DoD is the Approval Code block. If approval is required, an "A" appears in the block. Sometimes, "NR" is used when no approval is required. The following robust example was extracted from the general instructions of Exhibit A (CDRL package) of a recent RFP:

"Supplement Data Approval Requirements:

a. The letter “A” in Block 8 of the CDRL item means that the government must approve the data item. In addition, Block 16 of the CDRL form can contain directions concerning when the draft shall be submitted for approval. Written approval indicates agreement or concurrence with the contractors furnished data only and shall not be construed as changing any of the terms or conditions of the subject contract. The approval authority shall be the PCO in the form of a Contractual Document Action (CDA) with signatures by the PCO and the <Air Force Office of Primary Responsibility (AF OPR)> and dated by both.
b. Letters of Transmittal for data requiring government approval shall state “For Approval.” **Data items submitted for approval are NOT automatically approved without government approval.**
c. Disapproval: The contractor shall revise the data IAW specific written comments and resubmit. The resubmitted data will require a new approval cycle as indicated in Block 8 of the CDRL.
d. When required, the contractor shall resubmit NLT 30 CD from receipt of government comments/disapproval.
e. When an “A” is not indicated in Block 8, the PCO still retains the right to disapprove any data that does not comply with the contract requirements."

When the Government approves a CDRL item, it means that the Government is accepting the delivery of the CDRL item for satisfaction of that contract requirement and that no more work on that item is required at the current time. It does not mean that the Government is approving the content. The Government can also submit comments on the CDRL item and expect corrections before it will approve the CDRL item.

Example language taken from an individual CDRL item that requires approval stated:

"(BLK 8):

a. Approval shall be by Contractual Document Action (CDA), AFSC Form 1691.
b. Government approval/disapproval/comments 45 CD after receipt.
c. If approved with comments or disapproved with comments, the contractor shall resubmit the document in its entirety 30 CD after receipt of Government comments."

Section 6, CDRL Data Item Description (DID) Identifiers, provides the recommended approval and authentication codes for the listed CDRL items.

2.5 CDRL Item Authentication

The Government issues the RFP and the Technical Requirements Document (TRD). When the System/Segment Specification (SSS) is final, the Government approves the SSS and modifies the contract to then require meeting the SSS instead of the TRD. The Government calls this change of the contract "authentication". The Government authenticates specifications at the level(s) the Government will manage. The Government would also authenticate interface requirements

specifications for external interfaces that cross the contract boundary. These might be Interface Requirements Specifications (IRSs) or some other form of interface specification.

The Government usually only authenticates the top two levels of specifications for the contract. This could be the system and segment SSSs, the segment and subsystem SSSs for the space segment, or the segment and element SSSs for the ground segment. If the contract is for an element, authentication could be for the element SSS, the Software Requirements Specifications (SRSs), the Interface Requirements Specification - Internal (IRS-I), and the hardware specifications. For user equipment, authentication could be for the system SSS and the software SRSs and IRSs. See Section 4.1 for an explanation of the levels of requirements.

Example authentication language from an individual CDRL item stated:

"Final shall be submitted for authentication 30 CD prior to SRR."

2.6 CDRL Item Forms

Different program offices require the use of different forms and tools for CDRL items. The DoD uses two main forms for CDRL items:

- Contractor Data Requirement Substantiation, and
- Contract Data Requirements List (1 data item) DD Form 1423-1.

The Contractor Data Requirement Substantiation form (called "585" after the AF Form 585) provides the justification of a CDRL item for a program. The DD Form 1423-1, Contract Data Requirements List (1 data item) is used for the content and delivery information. See **Section 13,** Resources, for more information on obtaining these forms.

Other branches of the Government use other forms, but the basic justification and tailoring are covered similarly.

2.7 CDRL Package

The CDRL package, often called Exhibit A, usually lists the CDRL items at the front of the CDRL section with general overall instructions for delivery. The table generally has the fields shown in **Table 2.7-1**, Master CDRL List – Example 1.

- CDRL item identifier, e.g., A001, A002
- Title: The title from the Data Item Description (DID), e.g., Interface Requirements Specification (IRS), Technical Report - Study Services, or System/Subsystem Specification (SSS). The acquisition rules do not allow this name to differ from the name of the DID.
- Subtitle: If used, this is the name or names that the program wants to call the deliverable(s) instead of the title. For example, the IRS can be referred to as the “Interface Requirements Specification – External (IRS-E)” if this appears in the Subtitle field. Likewise, the SSS can be used at the segment and element levels. The names "Segment Specification (SS) and Element Specification (ES)" would appear in the Subtitle field.
- Data Item Description (DID) identifier. This is the identifier of the DID. For example, in "DI-IPSC-81431A/T" the "A" indicates the revision of the DID. When there is no letter after

the numerical part of the DID, it represents the original issue of the DID. The "/T" indicates that the DID was tailored for the specific program.

Often the Title and Subtitle fields are combined with a colon and a line break separating them, as shown in **Table 2.7-2**, Master CDRL List - Example 2 below.

Table 2.7-1: Master CDRL List - Example 1

CDRL Identifier	Title	Subtitle	Data Item Number
Ann1	Interface Requirements Specification	Interface Requirements Specification – External (IRS-E)	DI-IPSC-81434A/T
Ann2	Technical Report - Study/Services	Software Architecture Description (SAD)	DI-MISC-80508B/T
Ann3	System/Subsystem Specification (SSS)	Segment Specification (SS) and Element Specification (ES)	DI-IPSC-81431A/T
…			

Table 2.7-2: Master CDRL List - Example 2

CDRL Identifier	Title, Subtitle, and SOW Paragraph	Data Item Number
Ann1	Interface Requirements Specification: Interface Requirements Specification – External (IRS-E)	DI-IPSC-81434A/T
Ann2	Technical Report - Study/Services: Software Architecture Description (SAD)	DI-MISC-80508B/T
Ann3	System/Subsystem Specification (SSS): Segment Specification (SS) and Element Specification (ES)	DI-IPSC-81431A/T
…		

3. Data Item Description (DID) and Standards Tailoring

Part of the RFP specifies the standards to be used on the contract for compliance and for reference. The standards are generally listed as part of the Statement of Work (SOW). If there is not a SOW, then the standards list and their tailoring becomes an attachment to the contract. Often the standards need to be tailored. The relevant CDRL item tailoring should refer to the particular standard, "as tailored for this contract" if the standard is tailored.

The data item descriptions (DIDs) can usually be obtained at the Acquisition Streamlining and Standardization Information System (ASSIST) web site. See **Section 13,** Resources for more information. The site also provides military specifications, and standards.

There are military and commercial standards that are specified in the RFP by the Government and other standards are sometimes added by the contractor. See *"SMC Compliance Specifications and Standards"*, Aerospace Report No. TOR-2007(8583)-6475, [**SESpecsStds**], and *Recommended Software Standards for Space Systems,"* Aerospace Report No. TOR 2004-(3909)-3406, [**SWStds**], for the lists of recommended standards for systems engineering and software engineering, respectively. Some standards apply as is, while other standards need tailoring for the specific program. Please consult with the software acquisition experts about the standards that should be selected and which standards should be tailored for the specific program. See **Section 13**, Resources. This CDRL TOR only discusses standards tailoring as it relates to the CDRL items.

In addition to the standards and DIDs, there are sometimes templates associated with a standard for the individual CDRL items. One such example is in "*Software Development Standard for Space Systems,*" Aerospace Report No. TOR-2004(3909)-3537, [**SWDevStd**], which includes the template for the SDP that matches the activities in the standard. Such templates can also be tailored. This tailoring is done in the tailoring of the standard, not in the CDRL item tailoring ("1423") form.

If a data item (e.g., Software Development Plan, Software Architecture Description) is required with the proposal, both the 1423 and a Section L attachment will reference the tailoring of the standard for the content of the template, "as tailored for this contract".

In summary, there can be three types of tailoring for a program. **Table 3-1** shows the allowed tailoring for each type of requirement. "Tailoring down" means adapting the requirements to those that are applicable to the program. It does not mean deleting requirements to make the program easier or cheaper to implement. For example, if a standard requires something be done for the spacecraft and the contract is for a ground system, it does not make sense to require the program to perform the activities for the spacecraft (other than, e.g., the required interfaces, simulations, databases). Please consult the software acquisition and process experts for assistance with tailoring all three types of requirements. See **Section 13**, Resources. The program staff and acquisition experts collaborate on tailoring the standards and CDRL items to the needs of the program.

Table 3-1: Tailoring Permitted

Tailoring	Standards	Document Templates	Data Item Descriptions
Tailoring (down) to reduce requirements	X	X	X
Tailoring (up) to increase requirements	X	X	Not Allowed

4. Recommended Software-Related Contract Deliverables (i.e., CDRL items)

Several sets of CDRL items are discussed in this section. These CDRL items are software CDRL items and software-related CDRL items that software depends on or that have software considerations. They are grouped as follows:

- Software CDRL items
  - Usual software CDRL items
  - Special software CDRL items (Unique Hardware or Firmware CDRL items)
- Higher Level CDRL items software depends on
  - Contract-level (e.g., System, Segment) CDRL items software depends on
  - Next Level CDRL items (segment, spacecraft or payload, subsystem, or element)
- Reliability, maintainability, and availability CDRL items
- Special CDRL items
  - Human System Integration (HSI) CDRL items
  - Information Assurance (IA) CDRL items
  - Aviation Safety CDRL items

Special CDRL items that are software-related, such as those pertaining to Human System Integration (HSI) and Information Assurance (IA), are briefly mentioned in this document, however specific details are not provided for these CDRL items. Instead, references to the areas of expertise that can help with these CDRL items are provided. See **Section 13**, Resources.

For each CDRL item, the contractor is typically required to:
1) deliver one paper copy to the Government,
2) deliver on media or transmits an electronic copy to the Government, and
3) place a copy on the electronic data interchange network (EDIN).

The EDIN is a means for the contractors to share information with the Government and other team members. Other products that are not CDRL items are also placed on the EDIN for the Government and other team members to review. The EDIN is discussed more in **Section 5.3**, Electronic Data Interchange Network (EDIN).

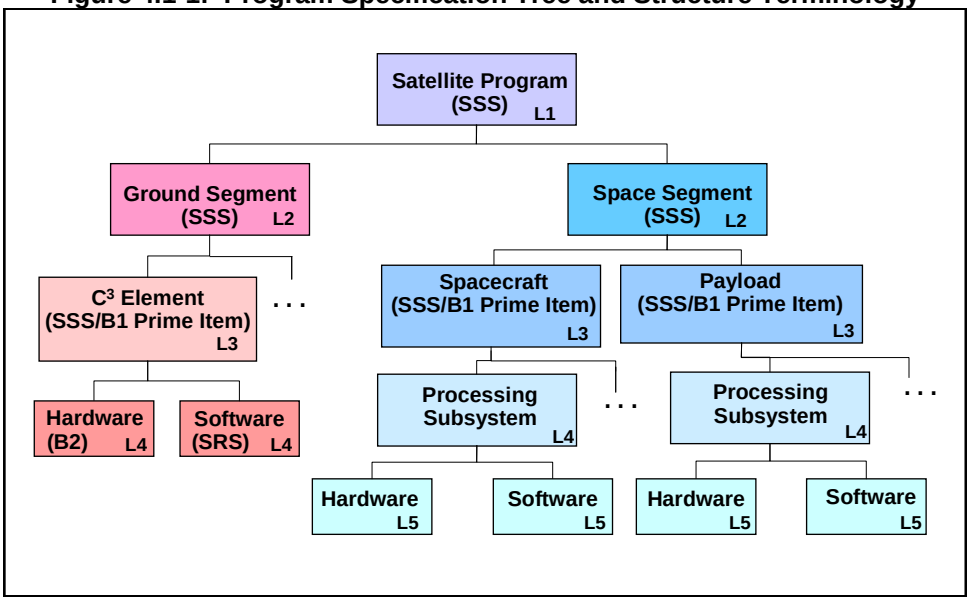
4.1 Specification Tree Example

A program has several layers of products. Software for a program is developed in an environment that includes the parent process and product requirements. See **Figure 4.1-1**, Program Specification Tree and Structure Terminology, for an example of a specification tree that also demonstrates the terminology of the various parts of a space program. The example program consists of the space "segment" and the ground "segment".

The space segment is divided into spacecraft and payload. Each of those is divided into "subsystems". Each subsystem consists of "hardware items" and "software items".

The ground segment is divided into "elements". Each of those elements generally consists of "hardware items" and "software items", although there can be intermediate levels between the element and the items.

Figure 4.1-1: Program Specification Tree and Structure Terminology



Also see Figure 13, pg. 38 of "*A Framework for Software Products Within a System Context (2nd Edition),*" Aerospace Report No. TR-2002(8550)-3, [**Framework**] for an example of the relationships between software CDRL items.

4.2 Software CDRL Items

The recommended software CDRL items are listed in **Table 4.2-1**, Software CDRL items. Some CDRL items are developed for the program's entire set of software and others are produced for each Software Item (SI), formerly known as a Computer Software Configuration Item (CSCI). The "Software Level" column in **Table 4.2-1** also shows which software CDRL items are developed for all software (one CDRL item, e.g., the SDP that covers all the SIs). The "Per Software Item (SI)" column shows which CDRL items are developed for each SI. Note that the software CDRL item tailoring in **Section 10** allows for combining some of the SI CDRL items based on the integration strategy provided in the Software Master Build Plan (SMBP).

The tailored CDRL item 1423s are listed alphabetically in **Section 10**, Software CDRL Item 1423 Forms.

Table 4.2-1: Recommended Software CDRL Items

	Plans	Software Level	Per Software Item (SI)
1.	Software Development Plan (SDP)	X	
2.	Software Master Build Plan (SMBP)	X	
3.	Software Transition Plan (STrP)	X	
	Reports		
4.	Software and System Measurement Report (SSMR)	X	
5.	Software Resources Data Reporting: Initial Developer Report and Data Dictionary (SRDR-I)	X	
6.	Software Resources Data Reporting: Final Developer Report and Data Dictionary (SRDR-F)	X	
	Requirements		
7.	Software Requirements Specification (SRS)		X
8.	Interface Requirements Specification (IRS-E) – External (Interfaces External to the Contract Scope)	X	
9.	Interface Requirements Specification (IRS-I) – Internal (Interfaces Internal to the Contract)	X	X
	Design		
10.	Software Architecture Description (SAD)	X	
11.	Database Design Description (DBDD)	X	
	Test and Verification		
12.	Software Test Plan (STP)		X
13.	Software Test Description (STD)		X
14.	Software Test Report (STR)		X
	Delivery, Installation and Maintenance		
15.	Software Version Description (SVD)		X
16.	Software Product Specification (SPS)		X
	Operations		
17.	Software User Manual (SUM)		X

The *Software Development Standard for Space Systems,* **[SWDevStd]** requires the products listed in **Tables 4.2-1** and **4.2.2-1**, and some of the products in **Table 4.3-1** to be developed. See the standard for more information. Space and Missile Systems Center (SMC) Instruction, Software Acquisition Instruction, [**SMCI 63-104**] also requires the products to be developed.

4.2.1 Comments About Specific Software CDRL Items

More information about specific software CDRL items follows.

- Database Design Description (DBDD)

- There is usually a database for the space vehicle constants needed for various types and levels of testing, launch, on-orbit check out, and operations. This database also often contains code to be uploaded to the spacecraft and anomaly detection and recovery (ADR) values. These constants, values, and code are often different for each testing level, launch, checkout, and operations. They need to be carefully reviewed and tightly controlled.
- The DBDD should be a DAL item only when there is no space segment and the ground segment does not need to develop or control this spacecraft constants database. See **Section 5.2**, Data Accession List (DAL).
- In any other cases, the DBDD should be a CDRL item.

- Interface Requirements Specification (IRS)
  - A separate IRS CDRL item is not used for each interface. The IRS CDRL item may contain multiple individual interfaces, e.g., segment-segment, payload-bus, and ground element-ground element.
  - Sometimes external IRSs are used at the contract level to document interfaces with entities outside the contract level (e.g., system- or segment-level with another system or segment on a different contract).
  - There can also be an internal IRS for interfaces internal to the contract.
  - If IRSs are used for both internal and external interfaces, then this is one of the few cases when two separate CDRL items (using the same DID) are specified: one for all the external interfaces and one for all the internal interfaces.
  - The IRS CDRL items have different authentication rules. See **Section 2.5** on authentication.
  - Sometimes different terms are used interchangeably, leading to confusion, e.g., "Interface Control Documents (ICDs)" are used for external interfaces and "IRS"s are used for interfaces internal to the contract.
  - The Government usually controls interface definitions that affect multiple contracts, e.g., space segment, ground segment, or user segment. These controlled interfaces are usually called ICDs.
- Software and System Measurement Report (SSMR)
  - The Software Measurement Report (SMR) is often augmented with system or segment measurements and renamed the Software and System Measurement Report (SSMR).
  - The RFP needs to include access to the metrics database(s) to allow analysis of trends and potential problems and is not just the information provided in a PDF SSMR document. RFP Section H usually specifies such access. See **Section 11** for example Section H language.
- Software Resources Data Reporting (SRDR) – Initial and Final Developer Report and Data Dictionary
  - The SRDR recently changed from the DD Form 2630 series to DID DI-MGMT-81739 and DI-MGMT-81740. There is little experience with tailoring for these new DIDs. A future revision of this document should have more information on these CDRL items. In the meantime see the software acquisition, software estimation, and financial experts for assistance. See **Section 13**, Resources.
  - The SRDR supplies the Government with basic information about the size, effort, schedule, and quality of a developed software product.

- This information is parallel to the Government cost estimation in the Cost Analysis Requirements Document (CARD). See **Section 13**, Resources, for more information about the SRDR and its instructions and forms.
- This information is also parallel to National Security Space Acquisition Policy Number 03-01, paragraph AP3.4, Data Collection.
- Defense Cost and Resource Center web site states: "Contractors must submit an Initial Developer Report within 60 days of contract award and a Final Developer Report within 60 days of contract completion. Additionally, for each software release, contractors must [submit] an Initial Developer Report within 60 days of the release start and a Final Developer Report within 60 days of the release completion. Typically, a contractor developing software for an ACAT I program will submit multiple pairs of these SRDRs over the duration of the contract."
- Often the CDRL package includes the other forms inserted after the 1423, especially since the forms are relatively new. Sometimes the program office chooses to provide links to the forms.
- The acquisition program office financial point of contact often is in charge of the SRDR.

- Software User Manual (SUM)
  - The SUM is useful earlier in the life cycle for developers, and internal and external users and testers (e.g., AFOTEC) to become familiar with the required behavior of the system and the interactions with the system.
  - The Logistics point of contact (POC) is often in charge of the SUM.
  - The Air Force logistics organization sometimes includes the information that would be in the SUM as part of their on line Tech Orders CDRL item. If so, then a separate SUM is not required as a CDRL item.

4.2.2 Unique Hardware or Firmware CDRL Items

The CDRL items associated with software in **Table 4.2.2-1**, Unique Hardware and Firmware CDRL items, are required only for the special cases listed in the table subheadings. Please contact the software acquisition experts (See **Section 13**, Resources) for assistance with the justifications and tailoring for these CDRL items.

Table 4.2.2-1: Unique Hardware and Firmware CDRL Items

CDRL items if Unique Hardware is Used
Computer Operation Manual (COM)
Computer Programming Manual (CPM)
CDRL Item if Firmware is Used
Firmware Support Manual (FSM)

4.3 System and Segment CDRL Items Software Depends On

As stated earlier, a space program typically has multiple levels in its specification tree. The levels above the individual hardware and software items are referred to as a system, segment, subsystem, or element depending upon the program terminology. See **Figure 4.1-1** and **Section 4.1** for sample terminology of the various parts of a space program.

Successful software development depends on having the necessary system, segment, subsystem, and element CDRL items in place, as well as the appropriate software CDRL items for the contract. The contract may cover the entire space system, or it may address only the space segment, the ground segment, or user equipment. The top level (whether system, segment, subsystem, or element level) of the contract needs to include certain key CDRL items.

Many of these key contract-level and systems engineering CDRL items are listed and discussed with their tailoring in *Systems Engineering Contract Data Requirements Selection Guidelines For National Security Space Programs,* Aerospace Report No. TOR-2004(8583)-3227, **[SE-CDRL]**. That document provides guidance for identifying systems engineering CDRL items. Furthermore, that document describes how to prepare a CDRL item for inclusion in the RFP and contract by explaining how to fill in the Contract Data Requirements List form, DD - 1423-1, hereafter referred to as a 1423. Examples of 1423 contents for systems engineering CDRL items are included in that documentation.

Certain of these key systems engineering CDRL items, that are software-related, are listed and discussed within this document. **Table 4.3-1**, System CDRL Items at Multiple Levels, lists these key software-related system CDRL items and **Appendix A**, Systems Engineering and Software CDRL Items, lists the CDRL items that are currently provided in **[SE-CDRL]** as well at the list of CDRL items provided in this TOR.

Several top level and lower level CDRL items are required by standards, such as Aerospace Report No. TR-2000(3909)-3537, "*Software Development Standard for Space Systems"* **[SWDevStd]**. Standards for systems engineering are listed in *"SMC Compliance Specifications and Standards",* Aerospace Report No. TOR-2007(8583)-6475, **[SESpecsStds]**.

Some of the key software-related CDRL items are produced as one document for the entire contract, while others are produced as individual documents for each entry in multiple programs levels. For example, the SSS Data Item Description (DID) is named System/Subsystem Specification (SSS), but each level has its own specification with its own subtitle: System Specification, Segment Specification, Subsystem Specification, or Element Specification, as appropriate. One 1423 for the SSS in the RFP Exhibit A package covers all such specifications and gives the required subtitles, the timing, and the differing content for each level required by the contract.

See **Section 2.1**, Terminology Conventions, for a discussion of <yellow text> and "system", "segment", and "system/subsystem" vs. "system/segment" in the names of CDRL items. See **Section 4.1**, Specification Tree Example, for a discussion of the levels of specifications.

In contrast, the SSDD is the design for the contract. It only appears at the top level for the contract, but includes the design of the next level down. Depending on the level of the contract, it may have a subtitle of Segment/Element Design Description, or Segment/Subsystem Design Description.

The test documents will also have one title (matching the DID) and possibly multiple subtitles matching the names of the levels for the program, e.g., Segment Test Plan and Element Test Plan.

Table 4.3-1: System CDRL Items for Multiple Levels

CDRL Item	Contract Level	Lower Levels
Plans		
Systems Engineering Management Plan (SEMP)	X	
Configuration Management Plan (CMP)	X	
System/Segment Integration and Verification Plan (SSIVP) – [Old Test and Evaluation Program Plan (TEPP)]	X	
Transition Plan (TrP)	X	
Data Accession List (DAL)	X	
Requirements		
System/Segment Specification (SSS)	X	X
Design		
Operational Concept Description (OCD)	X	
System/Segment Design Description (SSDD)	X	
Test and Verification		
System/Segment Test Plan (SSTP) – [Old Test Plan (TPln)]	X	X
System/Segment Test Description (SSTD) – [Old Test Procedures (TPrc)]	X	X
System/Segment Test Report Plan (SSTR) – [Old Test Inspection Report (TIR)]	X	X
Delivery, Installation and Maintenance		
Orbital Operations Handbook (OOH)	X	

Notes on specific CDRL items:

- Orbital Operations Handbook (OOH)
  - The OOH contains the information needed by the operators to successfully fly the satellite, including both nominal and off-nominal operations.

4.4 Reliability, Maintainability, and Availability (RMA) CDRL Items

System and software reliability, maintainability, and availability (RMA) are closely related. Therefore, the associated software-related CDRL items must be linked to those of the overall system. The Government has traditionally used *"Military Standard Reliability Program for Systems and Equipment"*, MIL-STD-785B, for ground systems and "*Military Standard Reliability Program Requirements for Space and Launch Vehicles"*, MIL-STD-1543, for space systems.

As a result of the acquisition reform trend of the 1990s, the Government participated in the development of a “commercial” standard by the Society of Automotive Engineers (SAE) called Reliability Program Standard, SAE JA 1000, and a related standard for software called Software

Reliability Program Standard, SAE JA 1002, as well as an implementation guide called Software Reliability Program Implementation Guide, SAE JA 1003.

The Government approach using MIL-STD-1543B and MIL-STD-785B is specific, prescriptive, and process-oriented. It is well suited for incorporation into SOWs and there are DIDs for many of its tasks.

The SAE approach using SAE JA 1002 is less prescriptive and more technically oriented. It is written from the perspective of an organization imposing processes and standards onto itself to meet customer requirements. SAE JA 1002 has a very important advantage: it already exists as a recognized and validated industry standard that represents the consensus of authors from a number of different supplier and customer perspectives. This section addresses both of these approaches.

Table 4.4-1 lists the reliability, maintainability, and availability CDRL items. Please contact the software reliability, maintainability, and availability experts (See **Section 13**, Resources) for assistance with these CDRL items.

Table 4.4-1: Reliability, Maintainability, and Availability CDRL Items

MIL-STD-785B and MIL-STD-1543B Approach
Reliability Program Plan (RPP)
Reliability Allocations, Assessment, and Analysis Report (RAAAR)
Reliability Modeling and Prediction (RMAP)
Failure Modes and Effects Analyses and Criticality Analyses (FMEA/CA)
Reliability Test Plans and Reports (RTPP)
Failure Reporting and Corrective Action System (FRACAS) Reports
SAE JA 1002 Approach
Software Reliability Plan (SRP)
Software Reliability Case (SRC)

4.4.1 MIL-STD-785B and MIL-STD-1543B Approach

With this approach, CDRL items are written to address the following tasks:

- **Reliability Program Plan:** The software reliability program plan describes the organization, activities, resources, schedules, and deliverables for the software RMA activities (often integrated into a system-level reliability program plan or the system engineering management plan).
- **Reliability Allocations, Assessment, and Analysis Report:** The software RMA Allocations lists the *anticipated* failure rates, recovery times, and recovery probabilities (coverage) of each of the components in the software architecture and shows how they, when combined with hardware allocations, will meet the reliability and availability requirements (for all identified system modes and states) in the specification. Allocations are usually performed using a system level RMA model that incorporates both hardware and software components.

- **Reliability Modeling and Prediction:** The software RMA Predictions utilize *measured* failure rates, recovery times, and recovery probabilities for executable components and predict the overall system reliability and availability for each mode and state identified in the specifications. The predictions may use the same RMA model that was used for the allocations in which anticipated parameters are updated with actual parameters. In order to ensure that sufficient data for the predictions exist, the RMA program plan should provide for sufficient testing and data collection. In cases where commercial items, also known as Commercial-Off-The-Shelf (COTS), or other previously developed components are utilized, a measurement program could be started at any time (including immediately) after authorization to proceed.
- **Failure Modes and Effects Analyses and Criticality Analyses:** The software and systems Failure Modes and Effects Analyses and Criticality Analyses (FMEA/CA) enumerate the categories of failures that can be experienced by each of the major architectural elements, their impact, and the manner of recovery. For software, the FMEA/CA should be done at the functional level for all major software elements that exist at runtime. Top level design documents are usually sufficient; it is not necessary to enumerate failure modes and effects at lower levels except for the most critical system elements, where examination of the source code provides additional insight into the manner in which such software elements can fail.
- **Reliability Test Plans, Procedures, and Reports:** Reliability-related test plans, test procedures, and test reports describe or address how operating times, recovery times, and failure data are collected. Special care should be taken to ensure that all failures are recorded - including repeats and non-replicable events. Typically, reliability testing is performed during integration testing (i.e., integrated into at least the segment level and integrated together with hardware), and includes failure and recovery testing and stability testing.
- **Failure Reporting And Corrective Action System (FRACAS) Reports:** The Failure Reporting And Corrective Action System (FRACAS) Reports include software discrepancy reports together with failure reports of hardware and other causes during development, test, and operation. A complete FRACAS Report provides qualitative insight into actual failure modes (which may in some cases be different than anticipated failure modes), quantitative data for software and system failure rates, recovery times, and recovery probabilities. A major value of the FRACAS Report is to identify symptoms that can subsequently be used to enhance system diagnostics.

4.4.2 SAE JA 1002 Approach

JA 1002 defines two documents: a reliability *plan* and a reliability *case*.

- **Software Reliability Plan:** The plan describes intended reliability processes, activities, and performance requirements (“forward view”).
- **Software Reliability Case:** The case provides evidence of software product reliability *achievement* as documented by quantitative and qualitative performance measures (“achieved view”).

4.5 Special System CDRL Items

The following CDRL items are required only for special cases.

4.5.1 Aviation Safety CDRL Items

A set of aviation safety CDRL items are required when aircraft flying in commercial airspace can be affected. Global Positioning System (GPS) programs are one example where aviation safety certification, approval, or assurance is required. The aviation safety CDRL items are shown in **Table 4.5.1-1**. There are two cases: one for ground or space segments and one for user equipment.

The space and ground segments each have the same list of aviation safety CDRL items with different tailoring for each segment.

For user equipment the "Military Standard Order: MSO-C145, Airborne Navigation Sensors Using The Global Positioning System (GPS) / Precise Positioning Service (PPS) For Area Navigation (RNAV) in Required Navigation Performance (RNP) Airspace; RNP-20 RNAV Through RNP-0.3 RNAV" (MSO C-145) CDRL item. The MSO-C145 CDRL item includes the Plan for Software Aspects of Certification (PSAC) and the Aviation Software Accomplishment Summary (ASAS), and is used with the tailored SVD to include the Software Configuration Identification (SCI).

The official list of CDRL items for aviation safety is negotiated for each program with the aviation safety approval authority, e.g., the Air Force Flight Standards Authority. Please plan to work early with the software safety experts for assistance with these aviation safety CDRL items. (See **Section 13**, Resources.)

Table 4.5.1-1: Aviation Safety CDRL Items

User Equipment
MSO C-145, which includes: - Plan for Hardware Aspects of Certification (PHAC) - Plan for Software Aspects of Certification (PSAC) - Aviation Software Accomplishment Summary (ASAS)
Software Configuration Identification (SCI) – The SCI can be tailored into the SVD.
Ground or Space
Aviation Safety Assurance Plan (ASAP), which includes: - Plan for Hardware Aspects of Certification (PHAC) - Plan for Software Aspects of Certification (PSAC)
Aviation Functional Hazard Assessment (AFHA)
Aviation Operational Safety Assessment (AOSA)
Aviation Preliminary System Safety Assessment (APSSA)
Aviation System Safety Assessment (ASSA)
Artifacts to Support Aviation Safety Certification - Aviation Software Accomplishment Summary (ASAS)

4.5.2 Human Systems Integration (HSI) CDRL Items

The Human System Integration (HSI) CDRL items are listed here. HSI CDRL items primarily apply to the ground-based portions of space systems that directly interface with humans. For

assistance with HSI CDRL items, please contact the human systems integration experts (See **Section 13**, Resources).

Table 4.5.2-1: Human Systems Integration (HSI) CDRL Items

CDRL Item Name
Human Engineering Design Approach Document – Maintenance (HEDAD-M)
Human Engineering Design Approach Document – Operator (HEDAD-O)
Human Engineering Program Plan (HEPP)
Human Engineering System Analysis Report (HESAR)
Human Engineering Test Plan (HETP)
Human Engineering Test Report (HETR)

4.5.3 Information Assurance (IA) CDRL Items

The frequently used Information Assurance (IA) CDRL items are listed here. National Security Agency (NSA) frequently requires additional CDRL items on particular programs. The official list of CDRL items for cryptography is negotiated for each program with NSA. For assistance with IA or other software security-related CDRL items, please contact the information assurance experts (See **Section 13**, Resources). Their consultation is necessary since the information assurance policies and instructions frequently change. Please plan to work early with the information assurance experts on the Information Assurance Development Plan. This document should be a compliance document.

Table 4.5.3-1: Information Assurance (IA) CDRL Items

CDRL Items for All Systems
Information Assurance Development Plan
Program Protection Implementation Plan (PPIP)
CDRL Items for NSA Cryptography
Fail Safe Design Analysis (FSDA)
Theory of Design and Operation (TDO)
Theory of Compliance (TOC)
Key Management Plan (KMP)
Security Production Assurance (SPA)
TEMPEST Control Test Plan and Report

Note: "TEMPEST" refers to emanations and is not an acronym.

5. Data Accession List (DAL) Items

5.1 Non-deliverables

In addition to the CDRL items, there are a number of items prepared by the contractor to develop, test, and manage a program or to document compliance with the work effort described in a Contractor Statement of Work (CSOW). Unlike the CDRL items, the contractor is not required to deliver these items to the Government.

5.2 Data Accession List (DAL)

There is a CDRL item called the Data Accession List (DAL) that consists of an index of the internally generated data items and computer software used by the contractor to develop, test, and manage a program or to document compliance with the work effort described in a Statement of Work (SOW). The contractor is not required to deliver the items shown on the DAL to the Government. However, the Government has the option to purchase one or more hard or electronic copies of the items listed in the DAL. The Government requires access to the DAL items as specified per the contract (such as via the Electronic Data Interchange Network (EDIN) which is explained below). The Government cannot purchase items that are neither CDRL items nor DAL items even though the Government paid to have them developed.

The items on the DAL are not always provided in a timely manner. However, the DAL is a useful legal mechanism to ensure that the Government can receive data items that are not CDRL items. The Government has to pay to receive hard copies of DAL items, if it exercises that right. There is generally a longer lag time for items on the DAL than items on the Electronic Data Interchange Network (EDIN).

5.3 Electronic Data Interchange Network (EDIN)

The Electronic Data Interchange Network (EDIN) is the means by which the Government and all contractor team members have access to data, including CDRL and DAL items, and other development items throughout the duration of a program. The EDIN is often implemented as a secure Virtual Private Network (VPN) that the Government and all contractor team members (including subcontractors and other partners) can access. Typically the contract specifies that the contractor implements and maintains the EDIN. RFP Section H specifies the requirements for electronic data access. See **Section 11** for example electronic data access language.

The EDIN allows access to everything that the contractor team members produce as part of the contract. For example, this includes, but is not limited to draft versions of CDRL items and such other work products as:

- Software development files (SDFs)
- Reports
- Minutes
- Trade studies

- Software interfaces
- Database detailed design data
- Software code
- Problem Failure Report (PFR) system
- Measurement database

These products of development (whether they are CDRL items or not) should be placed in the EDIN in a timely manner at the appropriate times consistent with the development life cycles, such as waterfall, incremental, or evolutionary life cycles. The Government team accesses these products on a daily basis for telecons or to review early versions of the products.

For example, preliminary products would be delivered for PDR and final products would be delivered for CDR. There would be updates for each build and for each increment and then the final products with the last build. See **Section 12**, References, [**LifeCycles**] for descriptions of waterfall, incremental, evolutionary, and spiral development life cycle models.

5.4 Software Products That Are Not Usually Deliverables

There are several software items that under the Military Standard Defense System Software Development, DOD-STD-2167, DOD-STD-2167A, MIL-STD-498, and TOR-2004 (3909)-3537 were often CDRL items. Currently, several of these items are not usually required as CDRL items, but rather are available via electronic access (or on the DAL to ensure that the Government could buy them if necessary). Some programs consider these products to be important and do require them as CDRL items. These include:

- Software Design Description (SDD)
- Interface Design Description (IDD)
  - The IDD is generally used for internal interfaces.
  - An IDD expanding on the design for external interfaces should be a CDRL item.
- Database Design Description (DBDD)
  - Refer to Section 4.2.1 for comments on the DBDD.

6. CDRL Data Item Description Identifiers

This section contains tables describing the recommended CDRL items and their Data Item Description (DID) identifiers. The tables in this section all use the same Data Item Description (DID) identifier notation. In "DI-IPSC-81429A/T" the "A" indicates the revision of the DID. When there is no letter after the numerical part of the DID and before the "/T", it is the original issue of the DID. The "/T" indicates that the DID was tailored for the specific program. Always check the ASSIST web site to verify that the most current and most relevant DID revision (e.g., Revision A, B) is used before tailoring is performed. See **Section 13**, Resources for more information.

Sections 2.4 and 2.5 discuss approval and authentication, respectively. The tables in this section also provide information about approval codes and authentication codes. These tables use "A" in the Approval/ Authentication Code column when approval is required or "NR" when approval is not required. "A" or "NR" is the entry placed in Block 8, Approval Code, of the Form 1423. Notes 2 and 3 address authentication.

6.1 Software CDRL Data Item Description Identifiers with Approval and Authentication Codes

Tables 6.1-1 through 6.1-5 list the Data Item Description (DID) names, acronyms, DID identifiers, approval codes, and authentication codes for the software CDRL items.

Table 6.1-1: Software CDRL DID Identifiers with Approval and Authentication Codes

Data Item Description Title: Subtitle	Acronym	Identifier	Approval/ Authentication Code
Plans			
Software Development Plan	SDP	DI-IPSC-81427 A/T Appendix H of TOR 2004(3909)-3537	A
Software Transition Plan (See Note 1)	STrP	DI-IPSC-81429 A/T	A
Technical Report-Study/Services: Software Master Build Plan [formerly Master Software Integration and Verification Plan]	SMBP MSIVP	DI-MISC-80508 B/T	NR
Technical Report-Study/Services: Software Reliability Plan	SRP	DI-MISC-80508 B/T	A
Requirements			
Software Requirements Specification	SRS	DI-IPSC-81433 A/T	A (See Note 2)
Interface Requirements Specification – External	IRS-Ext	DI-IPSC-81434 A/T	A (See Note 3)
Interface Requirements Specification – Internal	IRS-Int	DI-IPSC-81434 A/T	A
Design			
Technical Report-Study/Services: Software Architecture Description	SAD	DI-MISC-80508 B/T	NR
Database Design Description (See Note 4)	DBDD	DI-IPSC-81437 A/T	NR
Test - Formal Software Qualification Test			
Software Test Plan	STP	DI-IPSC-81438 A/T	A
Software Test Description	STD	DI-IPSC-81439 A/T	NR
Software Test Report	STR	DI-IPSC-81440 A/T	A
Technical Report-Study/Services: Software Reliability Case	SRC	DI-MISC-80508 B/T	NR
Delivery			
Software User Manual	SUM	DI-IPSC-81443 A/T	A
Software Version Description	SVD	DI-IPSC-81442 A/T	NR
Software Product Specification (as built, includes code and executables)	SPS	DI-IPSC-81441 A/T	A
Reports			
Technical Report-Study/Services: Software Measurement Reports OR Software and System Measurement Reports	SMR or SSMR	DI-MISC-80508 B/T	NR
Software Resources Data Reporting: Initial Developer Report and Data Dictionary (Initial Software Sizing Report and Guide)	SRDR Initial	New DI-MGMT-81739 (See Note 5)	NR
Software Resources Data Reporting: Final Developer Report and Data Dictionary (Final Software Sizing Report)	SRDR Final	New DI-MGMT-81740 (See Note 5)	NR

Note 1: Transition to maintenance; related to old Computer Resources Integrated Support Document (CRISD)
Note 2: SRS. Authentication should only be done for the first two levels of the contract. If there is only a system and software level, the SRS should be authenticated.
Note 3: IRS. See the IRS notes in **Section 4.2-1**. Sometimes external IRSs are authenticated.

Note 4: For spacecraft constants, anomaly detection and recovery values, and uploadable code - Otherwise, a DAL item
Note 5: SRDR. See the SRDR notes below Table 4.2-1 and see **Section 13**, Resources, for links to more detailed information.
Note 6: For approval code, "A" indicates approval is required; "NR" indicates approval is not required.

Table 6.1-2: Software Special Case CDRL DID Identifiers with Approval Codes

Data Item Description Title: Subtitle	Acronym	Identifier	Approval Code
Firmware Only			
Firmware Support Manual [Only needed if uniquely developed firmware will be maintained by different organization]	FSM	DI-IPSC-81448 A/T	A
Unique Hardware Only			
Computer Operation Manual	COM	DI-IPSC-81446 A/T	A
Computer Programming Manual	CPM	DI-IPSC-81447 A/T	A

Table 6.1-3: Obsolete Software CDRL DID Identifiers

No Longer Applicable	Acronym	Identifier
Software Center Operator Manual	SCOM	DI-IPSC-81444 A/T
Software Input/Output Manual	SIOM	DI-IPSC-81445 A/T
Software Installation Plan	SIP	DI-IPSC-81428 A/T

Table 6.1-4 lists the most common software DAL items.

Table 6.1-4: Software DAL Items

Data Item Description Title: Subtitle	Acronym	Identifier
Design		
Software Design Description	SDD	DI-IPSC-81435 A/T
Database Design Description	DBDD	DI-IPSC-81437 A/T
Interface Design Description	IDD	DI-IPSC-81436 A/T
Implementation		
Software Development Folders including: code; unit test cases and results; integration test plans, cases, and results.	SDF	

Table 6.1-5 lists the most common DIDs used for CDRL items that do not have a specific DID. The first two are most commonly used. The title is the DID Name in the first column. The subtitle is what the program wants to call the CDRL item as shown in **Table 6.1-1**, e.g., Software Architecture Description (SAD), Software Master Build Plan (SMBP) and Software Reliability Plan (SRP). Block 16 of the 1423 form must describe the desired contents for these CDRL items.

Table 6.1-5: Miscellaneous DIDs

Data Item Description Title: Subtitle	Identifier
Technical Report – Study/Services	DI-MISC-80508 B/T
Management Report	DI-MGMT-80004 A/T
Status Report	DI-MGMT-80368 A/T

6.2 System CDRL Data Item Description Identifiers with Approval and Authentication Codes

Tables 6.2-1 and 6.2-2 list the Data Item Description (DID) names, acronyms, DID identifiers, approval codes, and authentication codes for the system software-related CDRL items.

Table 6.2-1: System CDRL Items and Approval and Authentication Codes

Data Item Description Title: Subtitle	Acronym	Identifier	Aprv Code	Authentication
Plans				
System Engineering Management Plan	SEMP	DI-MGMT-81024 A/T	A	
Data Accession List	DAL	DI-MGMT-81453 A/T	NR	
Transition Plan	TrP	DI-MGMT-80790 /T	A	
Requirements				
System/Segment Specification	SSS	DI-IPSC-81431 A/T	A	A (top 2 levels)
Design				
Operational Concept Description	OCD	DI-IPSC-81430 A/T	A	
System/Segment Design Description	SSDD	DI-IPSC-81432 A/T	NR	
Test - Formal Qualification Test				
System/Segment Integration and Verification Plan [Old Test and Evaluation Program Plan]	SSIVP	DI-MISC-80508 B/T DI-NDTI-81284 /T	A	
System/Segment Test Plan [Old Test Plan (TPln)]	SSTP	DI-NDTI-80566 A/T	A	
System/Segment Test Description [Old Test Procedure (TPrc)]	SSTD	DI-NDTI-80603 A/T	NR	
System/Segment Test Report [Old Test/Inspection Report (TIR)]	SSTR	DI-NDTI-80809 B/T	A	
Delivery				
Orbital Operations Handbook	OOH	DI-M-3419 /T	A	

Note: For approval code, "A" indicates approval is required; "NR" indicates approval is not required.

Also see **Appendix A** and "*Systems Engineering Contract Data Requirements Selection Guidelines for National Security Space Programs"*, **[SE-CDRL]** for additional system CDRL items.

Table 6.2-2: System-level Aviation Safety CDRL Items and Approval Codes

Data Item Description Title: Subtitle	Acronym	Identifier	Aprv Code
Technical Report - Study/Services: Aviation Safety Assurance Plan	ASAP	DI-MISC-80508 B/T	A
Technical Report - Study/Services: Aviation Functional Hazard Assessment	AFHA	DI-MISC-80508 B/T	A
Technical Report - Study/Services: Aviation Operational Safety Assessment	AOSA	DI-MISC-80508 B/T	A
Technical Report - Study/Services: Aviation Preliminary System Safety Assessment	APSSA See Note 1	DI-MISC-80508 B/T	A
Technical Report - Study/Services: Aviation System Safety Assessment	ASSA	DI-MISC-80508 B/T	A
Technical Report - Study/Services: MSO C-145 Certification Package	MSO C-145	DI-MISC-80508 B/T	A

Note 1: APSSA. "Preliminary" is not used in the general sense of draft, preliminary and final submissions of CDRL items. It is a specific set of analyses required earlier in the life cycle than the ASSA.

7. Deliverable Timing

This section lists the deliverables due for each System Milestone Review and for the Test Readiness Reviews or Builds at the appropriate level. The first set of tables provides the software CDRL item timing. The next set of tables provides the system and segment (or the top two levels of the contract) CDRL item timing. The last tables provided are for specialty engineering or special cases.

The tables show the recommended timing of the deliverables with respect to the milestone reviews. Generally a CDRL item (complete document) is required **45 days before** the review and a version incorporating Government comments is required **30 days after** the review (allowing the Government 45 days for comments and the Contractor 30 days to incorporate the comments). Timing of CDRL item deliveries is subject to changes from the recommended CDRL delivery timing based upon the program's needs. Exceptions are noted in the tables.

The complete set of CDRL items might not apply to every contract. Some contracts are Phase A Concept Development contracts that only include activities and products through SRR and SDR. Some contracts are only Phase B Preliminary Design, Phase C Complete Design, and Phase D Build and Operations, or some combination.

See **Section 4.2** and **Table 4.2-1** for which software CDRL items are developed for all software and which ones are developed for each software item (SI). SIs were formerly known as Computer Software Configuration Items (CSCIs).

Legend:
-Drft = Draft;
-Pre = Preliminary (Full content);
-Fin = Final;
-U * = Updates are required when changes occur.
Shading indicates authentication. Lighter shading indicates authentication under certain circumstances. See **Section 2.5**, CDRL Item Authentication.
A bolded box around the **CDRL-Fin** emphasizes the version of the CDRL item with the complete content ready to be delivered (and approved, if required). However, updates are sometimes required, e.g., with each software build. Expected updates are indicated with "-U". "-U*" with asterisk (*) represents that updates are provided only if the content changes.

7.1 Software Deliverable Names and Acronyms

Software Product Acronyms

IDD	Interface Design Description
IRS_E	Interface Requirements Specification (external)
IRS_I	Interface Requirements Specification (internal)
SAD	Software Architecture Description
SDP	Software Development Plan (Note: Could contain other plans as appendices, e.g., SCMP, SQA Plan, Reliability Plan)
SMBP	Software Master Build Plan
SSMR	Software and System Measurement Reports
SPS	Software Product Specification (as-built - includes the code)
SRDR	Software Resources Data Report (owned by financial)
SRS	Software Requirements Specification
STD	Software Test Description (test cases and test procedures)
STP	Software Test Plan
STR	Software Test Report
STrP	Software Transition Plan (transition to maintenance)
SUM	Software User Manual (often owned by logistics)
SVD	Software Version Description

Special Cases

COM	Computer Operation Manual (only if hardware is unique)
CPM	Computer Programming Manual (only if hardware is unique)
FSM	Firmware Support Manual (only if hardware is unique and will be maintained by others)

DAL Items

SDD	Software Design Description
DBDD	Database Design Description (except for spacecraft constants database)
IDD	Interface Design Description (except for external interfaces)
SDF	Software Development Files

Not Applicable

SCOM	Software Center Operator Manual
SIOM	Software Input/Output Manual
SIP	Software Installation Plan

Table 7-1: Phase A Software Contract Data Requirements List (CDRL) Items

Scope	Proposal	Contract Award +30 CD	SRR	SDR
All Software			SDP -Drft	**SDP -Fin**
				SAD -Drft
			IRS_E - Drft	IRS_E -Pre
		Software and System Measurement Report (Monthly)		
	(Owned by Financial)			SRDR I -Pre

Note 1: Each CDRL item is submitted 45 calendar days (CD) before the milestone review and then resubmitted 30 CD after the review, incorporating Government comments.
Note 2: The SRDR and software data sheets are usually owned by the financial point of contact.

Table 7-2: Phase B, C, and D Software Contract Data Requirements List (CDRL) Items

Scope	Proposal	Cntrct Award +30 CD	PDR	CDR	Each Build Review	Each Software TRR	Each Build Completion	Each Transition[7]
All Software	SDP -Drft	**SDP -Fin**	SDP -U *	SDP -U *				
			SRS -Pre	**SRS -Fin**[1]	**SRS -Fin**[2]	SRS -U *	SRS -U *	
			IRS-E -Pre	**IRS-E -Fin**[1]	**IRS-E -Fin**[2]	IRS-E -U *	IRS-E -U *	
			IRS-I -Pre	**IRS-I -Fin**[1]	**IRS-I -Fin**[2]	IRS-I -U *	IRS-I -U *	
	SAD -Drft	SAD -Drft	SAD -Pre	**SAD -Fin**[3]	**SAD –Fin**[4]	SAD -U *	SAD -U *	
			SMBP -Pre	**SMBP -Fin**	SMBP -U *			
		Software and System Measurement Report (Monthly)						
	(Owned by Financial)	**SRDR-I**			**SRDR-I** 60 CD **after** start of each build[6]			
						SRDR-F per build[6] delivery +60 CD	**SRDR F -Fin** last build[6] delivery +60 CD for all builds	
Software Item			STP -Pre	**STP -Fin**	STP -U	STP -U *		
					STD-Pre	**STD -Fin** TRR –105 CD		
							STR -Fin QT done +30 CD	
							SVD -Fin[5] -60 CD	**SVD -Fin**[5] -60 CD
							SPS -Pre[5] Del –60 CD **SPS -Fin**[5] Del +60 CD	
				SUM -Drft	SUM -Pre	SUM -Pre[5] TRR –60 CD	**SUM -Fin**[5] QT done +60 CD	**SUM -Fin**[5] –60 CD
				STrP -Pre	STrP -U	STrP –U		**STrP -Fin**[5] –105 CD

Note 1: SRS-Fin and IRS-Fin for waterfall or incremental lifecycle due at System CDR. IRS-E authenticated and (SRS and IRS-I under some circumstances).
Note 2: SRS-Pre and IRS-Pre for evolutionary lifecycle due at System PDR with updates at CDR; and SRS-Fin and IRS-Fin at beginning of each build.
Note 3: SAD-Fin for waterfall due at System CDR.
Note 4: SAD-Pre for incremental and evolutionary lifecycle due at System PDR, with updates at CDR and for each build and Final due at beginning of last build.
Note 5: SVD, SPS, SUM, and STrP are delivered for each build that is delivered for operations or maintenance.
Note 6: One SRDR-I and SRDR-F is completed for each build that will be delivered for operations, at the beginning and the end of the build, respectively.
Note 7: There is usually segment and system integration and test after each software build completion before transition to operations or maintenance.

7.2 System/ Segment/ Subsystem/ Element Deliverables with Respect to System Milestone Reviews

The following tables show the timing of the deliverables with respect to the system milestone reviews. Generally a CDRL item (complete document) is required **45 days before** the review and a version incorporating Government comments is required **30 days after** the review (allowing the Government 45 days for comments and the Contractor 30 days to incorporate the comments).

The top two levels might be System and Segment, Segment and Element for Ground, or Segment and Subsystem for Space (spacecraft or payload). Substitute the appropriate "level" terms for System and Segment levels to match the particular case. This does not mean the names of the DIDs. They stay the same and the subtitles change to match the real name of the products. System and Segment CDRL items are shown in the following tables. The deliveries specified are the nominal delivery events. The negotiated schedule of CDRL item deliveries in Phases B, C, and D depends on the degree of requirements differences from those in Phase A.

The acronyms and notation used in the tables are as follows:

System Acronyms:

OCD	Operational Concept Document
OOH	Orbital Operations Handbook
SEMP	System Engineering Management Plan (Can include CMP, QAP, Requirements Management Plan, Risk Management Plan)
SSDD	System / Subsystem Design Description
SSIVP	System / Subsystem Integration and Verification Plan
SSS	System / Subsystem Specification
SSTD	Test Description (test cases and procedures)
SSTP	Test Plan
SSTR	Test Report
TrP	Transition Plan

Legend:
-Drft = Draft;
-Pre = Preliminary (Full content);
-Fin = Final;
-U * = Updates are required when changes occur.
Shading indicates authentication
A bolded box around the **CDRL-Fin** emphasizes the version of the CDRL item with the complete content ready to be delivered (and approved, if required). However, updates are sometimes required, e.g., with each software build. These updates are indicated with "-U" or "-U*", where the asterisk (*) indicates that updates are provided only if the content changes.

Table 7-3: Phase A System (or Top Level) and Segment Contract Data Requirements List (CDRL) Items

Scope	Proposal	Contract Award +30 CD	SRR	SDR
System	SEMP -Drft	**SEMP -Fin**	SEMP –U*	SEMP -U*
	SSS -Drft	SSS -Drft	**SSS –Fin**	SSS -U*
			OCD -Pre	**OCD -Fin**
			SSDD -Drft	**SSDD -Fin**
				IRS_E -Pre
			SSIVP -Pre	**SSIVP -Fin**
				SSTP -Pre
				TrP -Pre
		Monthly Management Reports		
Segment			SSS –Pre	**SSS -Fin**

Legend: -Drft = Draft; -Pre = Preliminary (Full content); **-Fin** = Final; -U * = Updates are required when changes occur. Shading indicates authentication

Table 7-4: Phase B, C, and D System (or Top Level) and Segment Contract Data Requirements List (CDRL) Items

Scope	Proposal	Contract Award +30 CD	PDR	CDR	Phase D: Build & Operations		
					Each TRR	Each Increment Completion	Each Transition
System	SEMP -Drft	**SEMP -Fin**	SEMP -U *	SEMP -U *			
	SSS -Pre	**SSS -Fin**	SSS –U *	SSS –U *	SSS -U*		
		OCD -Fin	OCD -U *	OCD -U *			
		SSDD -Fin	SSDD -U *	SSDD -U *	SSDD -U*		
		SSIVP -Fin	SSIVP -U *	SSIVP -U*	SSIVP -U*		
			SSTP -Pre	**SSTP -Fin**	SSTP –U		
				SSTD -Pre	**SSTD -Fin** System TRR –105 CD		
						SSTR -Fin QT done +30 CD	
			OOH -Drft	OOH -Pre	OOH -Pre TRR –60 CD	**OOH -Fin** QT done +60 CD	OOH –U *
			TrP –Pre -U *	**TrP -Fin**	TrP -U *		TrP -U *
		Monthly Management Reports					
Segment		SSS -Pre	**SSS -Fin**	SSS –U *			
			SSTP -Pre	**SSTP –Fin**	SSTP -U		
				SSTD –Pre	**SSTD –Fin** Segment TRR–105 CD		
						SSTR -Fin QT done +30 CD	

Legend: -Drft = Draft; -Pre = Preliminary (Full content); **-Fin** = Final; -U * = Updates are required when changes occur.
Shading indicates authentication

Table 7-5a: Other Phase A Miscellaneous Software Contract Data Requirements List (CDRL) Items

Scope	Proposal	Contract Award +30 CD	SRR	SDR
All Software			ISACA-Drft	ISACA-Pre

Table 7-5b: Other Phase B, C, D Miscellaneous Software Contract Data Requirements List (CDRL) Items

Scope	Proposal	Cntrct Award $^{+30}_{CD}$	PDR	CDR	Each Build Review	Each Software TRR	Each Build	Transition
All Software					ISACA-Pre	**ISACA -Fin**		

Legend: -Drft = Draft; -Pre = Preliminary (Full content); **-Fin** = Final; -U * = Updates are required when changes occur.
Shading indicates authentication

Table 7-6: Data Accession List (DAL) Items

Scope	Proposal	Cntrct Award +30 CD	PDR	CDR	Each Build Review	Each Software TRR	Each Build
All Software				**SDD -Fin**	SDD -U *	SDD -U *	SDD -U *
				DBDD -Fin	DBDD -U *	DBDD -U *	DBDD -U *
				IDD -Fin	IDD -U *	IDD -U *	IDD -U *
					SDF -U	SDF -U	SDF -U

8. Software CDRL Item Purposes

8.1 Software CDRL Item Purposes

Each Data Item Description (DID) usually states the purpose of the data item. The purposes have been extracted to provide this information without the need to find and read the DID until the program decides to include a particular CDRL item. When tailoring the DID, it will be necessary to use the actual DID to determine what needs to be tailored. The Software Acquisition and Process Department can assist you with tailoring standards, DIDs, and templates. The CDRL item purposes are listed in alphabetical order by acronym.

Table 8.1-1: Data Items Associated with Software

Acronym, Name, Identifier, Date	Purpose
DBDD Database Design Description DI-IPSC-81437A	The **Database Design Description (DBDD)** describes the design of a database, that is, a collection of related data stored in one or more computerized files in a manner that can be accessed by users or computer programs via a database management system (DBMS). It can also describe the software units used to access or manipulate the data. The DBDD is usually used to describe the database of space vehicle constants needed for various types and levels of testing, launch, on-orbit check out, and operations. This database also often contains code to be uploaded to the spacecraft and anomaly detection and recovery (ADR) values. The DBDD provides visibility into the design and provides information needed for software support.
IRS – External Interface Requirements Specification - External DI-IPSC-81434A	The **Interface Requirements Specification (IRS-External)** specifies the interface requirements that are external to the contract on one or more systems, segments, hardware items (HIs), software items (SIs), manual operations, or other system components to achieve one or more interfaces among these entities. An IRS-External can cover any number of interfaces. The IRS-External specifies the requirements for the interfaces external to the contract. e.g., if the contract is for a segment, the IRS-External would specify the interfaces between the segment and other segments and systems. An IRS-External can be used to supplement the System/Segment Specification (SSS) and Software Requirements Specification (SRS) as the basis for design and qualification of testing of systems and software items. The IRS-External is used when the developer is tasked to define and record the interface requirements for one or more systems, segments, hardware items, software items, manual operations, or other system components.

Acronym, Name, Identifier, Date	Purpose
IRS – Internal Interface Requirements Specification - Internal DI-IPSC-81434A	The **Interface Requirements Specification (IRS-Internal)** specifies the internal interface requirements within the contract on one or more systems, segments, hardware items (HIs), software items (SIs), manual operations, or other system components to achieve one or more interfaces among these entities. An IRS-Internal can cover any number of interfaces. The IRS-Internal specifies the requirements for the interfaces internal to the contract. e.g., if the contract is for a segment the IRS-Internal would specify the interfaces within the segment. An IRS-Internal can be used to supplement the System/Segment Specification (SSS) and Software Requirements Specification (SRS) as the basis for design and qualification of testing of systems and software items. The IRS-Internal is used when the developer is tasked to define and record the interface requirements for one or more systems, segments, hardware items, software items, manual operations, or other system components.
SAD Software Architecture Description DI-MISC-80508B	The **Software Architecture Description (SAD)** contains multiple architectural perspectives, including both models and detailed textual descriptions of the logical organization, dynamic behavior, process decomposition, software organization, and physical realization of the software. The SAD consists of a collection of components with well-defined interface and service semantics that operate over an underlying infrastructure.
SDP Software Development Plan DI-IPSC-81427A and Aerospace Report No. TOR-2004(3909)-3537, Appendix H Rev B or later	The **Software Development Plan (SDP)** describes a developer's plans for conducting a software development effort. The term "software development" is meant to include the new development, modification, reuse, reengineering, incorporation of commercial item (also known as COTS) packages, maintenance, and all other activities resulting in software products. The SDP provides the acquirer insight into, and a tool for monitoring, the processes to be followed for software development, the methods to be used, the approach to be followed for each activity, and project schedules, organization, and resources. **Note**: The DID is tailored to require compliance with the content outlined in Appendix H of TOR-2004(3909)-3537, Software Development Standard for Space Systems, as tailored for the contract. The DID and the TOR are used when the developer is tasked to develop and record plans for conducting software development activities.

Acronym, Name, Identifier, Date	Purpose
SMBP Software Master Build Plan DI-MISC-80508B	The **Software Master Build Plan (SMBP)** contains plans for the integration and verification of software. It ensures that the contractor follows a disciplined approach to software build planning. The SMBP defines the hierarchy(ies) of software integration stages and the software requirements verification events in the integration hierarchy(ies) (i.e., the specific integration stages at which requirements verification will occur). The SMBP includes the allocation of software components and software requirements to integration stages and the allocation of software requirements to verification events. The SMBP also includes integration and verification schedules and the responsibilities for and location of each integration stage and verification event in the integration hierarchy. (The SMBP is sometimes known as the Master Software Integration and Verification Plan.)
SSMR Software and System Measurement Report DI-MISC-80508B	Each **Software and System Measurement Report (SSMR)** is an integrated report covering the software and system development activities for all significant software and system team members, as defined in section 1.2.2 of TOR-2004(3909)-3537, (i.e., any internal or external organization supporting or performing software and systems development or test including support provided through informal and formal agreements and contracts) throughout the project development. The SSMR provides explanations and interpretations of reported measurement data, including deviations from expected or projected values and breaches of thresholds, as well as any corrective actions being undertaken. The software and system measurements collected and reported each month are expected to vary because the lifecycle activities vary over time.
SPS Software Product Specification DI-IPSC-81441A	The **Software Product Specification (SPS)** contains or references the executable software, source files, and software support information, including "as built" design information and compilation, build, and modification procedures, for a software item. The SPS can be used to order the executable software and/or source files for a software item and is the primary software support document for the software item. The SPS is used when the developer is tasked to prepare executable software, source files, "as built" software item design, and related support information for delivery.

Acronym, Name, Identifier, Date	Purpose
SRDR-I Software Resources Data Reporting: Initial Developer Report and Data Dictionary DI-MGMT-81739	The **Software Resources Data Reporting: Initial Developer Report and Data Dictionary (SRDR-I)** is used to obtain the estimated characteristics of a software product and its development process. The intent of the SRDR process is to collect objective measurable data commonly used by industry and DoD cost analysts. These data are used to compile a repository of estimated software product sizes, schedules, and effort that Government analysts can draw upon to build credible size, cost, and schedule estimates of future software-intensive systems. The contractor submits the completed SRDR Initial Developer Report within 60 days after contract award for the entire software product, and within 60 days after initiation of each software release or build.
SRDR-F Software Resources Data Reporting: Final Developer Report and Data Dictionary DI-MGMT-81740	The final **Software Resources Data Reporting: Final Developer Report and Data Dictionary (SRDR-F)** is used to obtain the actual (as built) characteristics of a software product and its development process. The intent of the SRDR process is to collect objective measurable data commonly used by industry and DoD cost analysts. These data are used to compile a repository of actual software product sizes, schedules, effort, and quality that Government analysts can draw upon to build credible size, cost, and schedule estimates of future software-intensive systems. The contractor shall submit a completed SRDR Final Developer Report within 60 days of delivery of each delivered software release. The contractor shall submit a completed SRDR Final Developer Report for the entire software product within 60 days of delivery of the final software element.
SRS Software Requirements Specification DI-IPSC-81433A	The **Software Requirements Specification (SRS)** specifies the requirements for a software item and the methods to be used to ensure that each requirement has been met. Requirements pertaining to a software item's external interfaces may be presented in the SRS or in one or more Interface Requirements Specifications (IRSs) (DI-IPSC-81434A) referenced from the SRS. The SRS, possibly supplemented by IRSs, is used as the basis for design and qualification testing of a software item. The SRS is used when the developer is tasked to define and record the software requirements to be met by a software item.
STD Software Test Description DI-IPSC-81439A	The **Software Test Description (STD)** describes the test preparations, test cases, and test procedures to be used to perform qualification testing of a software item, or a software system or segment. The STD enables the acquirer to assess the adequacy of the qualification testing to be performed. The STD is used when the developer is tasked to analyze, define, and record the test preparations, test cases, and test procedures to be used for the software item qualification testing or for system qualification testing of a software system.

Acronym, Name, Identifier, Date	Purpose
STP Software Test Plan DI-IPSC-81438A	The **Software Test Plan (STP)** describes the plans for qualification testing of software items and software systems. It describes the software test environment to be used for the testing, identifies the tests to be performed, and provides schedules for test activities. The STP should address a logical collection of Software Items (SIs), e.g., one STP for the space segment, and one STP for the ground segment. The STP enables the acquirer to assess the adequacy of planning for software item and software system qualification testing. The STP is used when the developer is tasked to develop and record plans for conducting qualification testing or system qualification testing of a software system.
STR Software Test Report DI-IPSC-81440A	The **Software Test Report (STR)** is a record of the qualification testing performed on a software item, a software system or segment, or other software-related item. The STR enables the acquirer to assess the testing and its results. The STR is used when the developer is tasked to analyze and record the results of the software item qualification testing, system qualification testing of a software system, or other testing identified in the contract.
STrP Software Transition Plan DI-IPSC-81429A	The **Software Transition Plan (STrP)** identifies the hardware, software, and other resources needed for life cycle support of deliverable software and describes the developer's plans for transitioning deliverable items to the operations and support organizations. The STrP is developed if the software support concept calls for transition for responsibility from the developer to the operations and support organizations. The STrP is used when the developer is tasked to develop and record plans for transitioning deliverable items to the operations and support organizations.
SUM Software User Manual DI-IPSC-81443A	The **Software User Manual (SUM)** tells a hands-on software user how to install and use a software item, a group of related software items, or a software system or segment. It may also cover a particular aspect of software operation, such as instructions for a particular position or task. The SUM is developed for software that is run by the user and has a user interface requiring online user input or interpretation of displayed output. If the software is embedded in a hardware-software system, user manuals or operation procedures for that system may make separate SUMs unnecessary. The SUM is used when the developer is tasked to identify and record information needed by hands-on users of software.

Acronym, Name, Identifier, Date	Purpose
SVD Software Version Description DI-IPSC-81442A	The **Software Version Description (SVD)** identifies and describes a software version consisting of one or more software items. It is used to release, track, and control software versions. The term "version" may be applied to the initial release of the software, to a subsequent release of that software, or to one of multiple forms of the software released at approximately the same time (for example, to different sites). The SVD is used when the developer is tasked to identify and record the exact version of software to be delivered to a user, support, or other site.

9. Software CDRL Item Justifications

9.1 Software CDRL Item Justifications

Justifications for the following software CDRL items are included in this section, as shown in alphabetical order:

- Interface Requirements Specification – External (IRS-E) for interfaces that cross the contract boundary
- Interface Requirements Specification – Internal (IRS-I) for interfaces within the contract
- Software Architecture Description (SAD)
- Software Development Plan (SDP)
- Software Master Build Plan (SMBP)
- Software and System Measurement Report (SSMR)
- Software Product Specification (SPS)
- Software Resources Data Reporting: Initial and Final Developer Report and Data Dictionary (SRDR)
- Software Requirements Specification (SRS)
- Software Test Description (STD)
- Software Test Plan (STP)
- Software Test Report (STR)
- Software Transition Plan (STrP)
- Software User Manual (SUM)
- Software Version Description (SVD)

The following charts are used to brief justification of the CDRL items for the Data Call. The Office of Primary Responsibility (OPR) is filled in with the name of the person who will be responsible for ensuring that the CDRL item is included correctly in the RFP and later for reviewing the CDRL item on contract. *Italics* in the charts indicate language that only applies to aviation safety. That italicized language should only be included for programs, e.g., GPS, that require aviation safety. Abbreviations used are listed in Section 17, Acronyms and Abbreviations.

Frequency is usually related in these charts to a milestone review. See Section 7 for an explanation of the timing, usually submitted 45 calendar days before the review and then resubmitted incorporating Government comments 30 calendar days after the review.

Please contact the software acquisition experts (See **Section 13**, Resources) for assistance with a justification for this special CDRL item for spacecraft software:

- Database Design Description (DBDD) [Planned for a future revision of this document]

Interface Requirements Specification – External (IRS-E)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81434 A/T **Frequency:** Phase A: SRR, SDR
Phase B, C, D: PDR, CDR, per build

Justification for Requiring the CDRL Item:
- Defines the external SW-to-SW and SW-to-HW interface requirements
- Ensures a well-organized definition and documentation of software interfaces to proper level of detail for software development
- Enables independent software interface (I/F) requirements analysis by Government
- Provides leverage for the Government to approve the interfaces
- A separate document for SW I/F requirements reduces impact of frequent I/F changes to SRS
- *Mandatory documentation for requirements and interface control, traceability, and verification for aviation safety assurance*

Impact to Program if Not Delivered:
- Higher probability that software I/F requirements are not sufficiently thorough
- Higher probability that software I/F requirements are not documented sufficiently for clear communication and interpretation
- Increased software development and subsequent operational risk
- Higher probability of finding software development I/F problems late in life cycle resulting in increased costs and schedule

Interface Requirements Specification – Internal (IRS-I)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81434 A/T **Frequency**: Phase B, C, and D: PDR, CDR, per build

Justification for Requiring the CDRL Item:
- Defines the internal SW-to-SW and SW-to-HW interface requirements
- Ensures a well-organized definition and documentation of software interfaces to proper level of detail for software development
- Enables independent software interface (I/F) requirements analysis by Government
- Provides leverage for the Government to approve the interfaces
- A separate document for SW I/F requirements reduces impact of frequent I/F changes to SRS
- *Mandatory documentation for requirement and interface control, traceability, and verification for aviation safety assurance*

Impact to Program if Not Delivered:
- Higher probability that software I/F requirements are not sufficiently thorough
- Higher probability that software I/F requirements are not documented sufficiently for clear communication and interpretation
- Increased software development and subsequent operational risk
- Higher probability of finding software development I/F problems late in life cycle resulting in increased costs and schedule

Software Architecture Description (SAD)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-MISC-80508 B/T **Frequency**: Phase A: SDR
Phase B, C, D: Proposal, ATP, PDR, CDR, per build

Justification for Requiring the CDRL Item:

- Describes the software architecture (i.e., the top level software design)
- Reduces likelihood of undefined, volatile software architecture
- Enables independent analysis of the contractor's proposed software architecture to ensure it will meet software requirements and be flexible and extensible enough to handle changes and growth over the system life
- Provides leverage for the Government to influence software architecture
- *Mandatory documentation for traceability and verification for aviation safety assurance*

Impact to Program if Not Delivered:

- Higher probability of chaotic software design and development being performed because of an undefined or poor software architectural foundation
- Increased software development risk, especially for evolutionary or incremental development, resulting in increased cost and schedule
- Higher probability that software may not be supportable or maintainable
- *Unable to meet software civil aviation safety assurance requirements*

Software Development Plan (SDP)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81427 A/T* **Frequency**: Phase A: SRR, SDR
Phase B, C, and D: Proposal, ATP, PDR, CDR

Justification for Requiring the CDRL Item:

- Master plan for the entire software development effort
- Defines detailed plans and processes for all software engineering and management tasks
- Defines the detailed software development schedule and required resources
- Reduces likelihood of an unsuccessful software development effort
- Enables Government independent analysis of adequacy of software planning
- Provides leverage for the Government to influence plans and processes through approval code
- Supports contractual commitment to following SDP
- Compliant with Space Missile Systems Center Instruction 63-103 and 63-104
- *Describes processes and artifacts that conform with aviation safety assurance requirements*

Impact to Program if Not Delivered:

- Higher probability of inadequately defined software engineering and management processes resulting in cost increases and schedule slips
- Higher probability of lack of Government visibility into and influence over software plans and processes

** Use Appendix H of Software Development Standard for Space Systems, TOR-2004(3909)-3537*

Software Master Build Plan* (SMBP)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management
DID: DI-MISC-80508 B/T **Frequency**: Phase B, C, D: PDR, CDR

Justification for Requiring the CDRL Item:
- Provides the plans for laying out the increments and builds leading to integration and verification of software
- Prime driver of the software development schedule
- Ensures contractor follows disciplined and practical approach to software build planning
- Ensures Government independent analysis of adequacy of contractor's build planning
- Provides leverage for the Government to influence build plans
- Reduces software development risk, especially if the contractor uses an iterative software development life cycle model

Impact to Program if Not Delivered:
- Higher probability of lack of Government visibility and influence into contractor build content planning and re-planning (e.g., functionality and requirements slips into later builds) resulting in cost increases and schedule slips
- Higher probability of undisciplined approach to iterative software development (e.g., unknown and uncontrolled slips of capability to later builds)

* Also known as the Master Software Integration and Verification Plan (MSIVP)

Software and System Metrics Report (SSMR)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management
DID: DI-MISC-80508 B/T **Frequency**: Monthly from contract award

Justification for Requiring the CDRL Item:
- Provides monthly reporting of detailed software and system metrics
- Provides Government insight into software and system status throughout the life cycle
- Enables proactive independent Government analysis of metrics to identify problems early
- Provides Government with detailed visibility beyond top level program cost and schedule
- Provides leverage for the Government to influence metrics
- Uses industry best practice: Practical System and Software Measurement
- Complies with SMC Instruction 63-104

Impact to Program if Not Delivered:
- Lack of information necessary for effective program management to identify potential problems early
- Lack of visibility into true status of the evolving software products
- Higher probability of finding software development problems very late in life cycle resulting in increased costs and schedule
- Increased software execution risk

Software Product Specification (SPS)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81441 A/T **Frequency**: Phase B, C, D: Last build

Justification for Requiring the CDRL Item:
- Provides "as built" software documentation necessary for maintenance
- Essential for any software maintenance, especially if subject to competition for re-procurement, upgrade, or when software may be maintained by another organization
- Significantly more expensive to contract for this information later in the contract
- Mechanism for delivery of source code
- *Mandatory for aviation safety assurance*

Impact to Program if Not Delivered:
- Inadequate documentation of "as built" software needed to maintain the software by the contractor or another organization
- Lack of information needed for re-procurement

Software Resources Data Reporting: Initial and Final Developer Report and Data Dictionary (SRDR-I and SRDR-F)
OPR: <Fill In – Name, Role>

POC: Financial, Software Engineering, Systems Engineering, Program Management
DID: DI-MGMT-81739 Initial **Frequency**: Phase A: ATP, SDR
DID: DI-MGMT-81739 Initial **Frequency**: Phase B, C, D: ATP, start of each build +30 CD
DID: DI-MGMT-81740 Final **Frequency**: Phase B, C, D: each build +30 CD, last build +30CD

Justification for Requiring the CDRL Item:
- Provides estimated software size at start of program (ATP +30 CD), and start of each build (Start of each build +60 CD)
- Provides actual software size and cost for each delivery and at end of program
- Enables independent Government analysis for each build to identify risks
- Provides Government with visibility during program and for comparison to other programs
- Required by DoD Defense Cost and Resource Center (DCARC)

Impact to Program if Not Delivered:
- Lack of information necessary for effective program management to review reasons for increased size or cost and to identify potential problems
- Lack of visibility into true status of the evolving software product
- Higher probability of lack of Government visibility into and influence over software plans and processes
- Increased software development risk

Software Requirements Specification (SRS)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81433 A/T **Frequency**: Phase B, C, D: PDR, CDR, per build

Justification for Requiring the CDRL Item:
- Defines the software requirements that each software item must meet
- Defines the software verification and validation requirements
- Ensures well-organized definition and documentation of these items to sufficient level of detail (e.g., bidirectional traceability) for software development and control over requirements
- Enables independent software requirements analysis by Government team
- Ensures independent Government software analysis to ensure software requirements are adequately understood and verifiable
- Provides leverage for the Government to approve the requirements
- *Mandatory documentation for control, traceability, and verification for aviation safety assurance*

Impact to Program if Not Delivered:
- Higher probability that software requirements are not sufficiently thorough and understood
- Higher probability that software does not meet system requirements due to miscommunication
- Higher probability that software requirements are not documented sufficiently for verification and validation
- Higher probability of finding software development problems very late in life cycle resulting in increased costs and schedule
- Increased software execution risk

Software Test Description (STD)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81439 A/T **Frequency**: Phase B, C, D: Build review, TRR per build

Justification for Requiring the CDRL Item:
- Describes test preparation, cases and procedures for software qualification testing
- Provides a foundation for well-disciplined and documented software qualification testing
- Provides traceability back to design and requirements
- Provides repeatability of exact test conditions
- Enables independent Government analysis to ensure software qualification testing adequately verifies all software requirements
- Provides leverage for the Government to influence software qualification testing
- *Mandatory documentation to support aviation safety assurance*
- *Tailoring includes aviation software safety verification and validation cases, procedures*

Impact to Program if Not Delivered:
- Undefined or poorly defined software qualification test cases and procedures resulting in multiple testing iterations and increased cost and schedule
- Inadequately verified software requirements resulting in increased likelihood of mission critical failures

Software Test Plan (STP)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81438 A/T **Frequency**: Phase B, C, D: PDR, CDR, TRR per build

Justification for Requiring the CDRL Item:
- Describes the verification and validation strategy for software requirements
- Provides early identification of needed test resources to ensure their availability when needed
- Ensures the contractor plans for successful software qualification testing
- Enables Government independent analysis of adequacy of software verification planning
- Provides leverage for the Government to influence verification planning
- *Test plan is mandatory for aviation safety assurance*
- *Tailoring includes aviation safety software verification and validation planning*

Impact to Program if Not Delivered:
- Poorly defined or undefined software qualification testing plans resulting in inadequate testing and increased cost and schedule
- Likelihood of inadequate bidirectional requirements traceability (source requirement to its lower level requirements and across interfaces) in the test program
- Increased likelihood of inadequate testing and mission critical failures

Software Test Report (STR)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81440 A/T **Frequency**: Phase B, C, D: QT end per build

Justification for Requiring the CDRL Item:
- Provides a record of the results of software qualification testing (QT); aids troubleshooting and anomaly investigations.
- Ensures a well documented software qualification testing program
- Ensures maintenance of documented status of software requirements verification
- Ensures independent Government analysis of software qualification testing results to ensure that software requirements have been fully verified
- Enables analysis of software errors and provides information for reliability predictions
- *Mandatory for aviation safety assurance*
- *Tailoring includes aviation software safety verification and validation reporting*

Impact to Program if Not Delivered:
- Poorly documented or undocumented software qualification testing results
- Uncertain software requirements verification status
- Increased software execution risk

Software Transition Plan (STrP)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, Logistics
DID: DI-IPSC-81429 A/T **Frequency**: Phase B, C, D: CDR, Transition

Justification for Requiring the CDRL Item:
- Provides the plan for transitioning the software to the operations and maintenance environment
- Identifies the hardware, software, and other resources needed for life cycle support
- Essential if the software will be transitioned to an organization other than the initial developer for maintenance
- Essential for a smooth and well-managed transition to operations

Impact to Program if Not Delivered:
- Higher probability of problems transitioning software to operations or to another organization for maintenance
- Higher probability of unexpected cost and schedule impacts late in life cycle if transitioning to operations or to another organization for maintenance

Software User Manual (SUM)
OPR: <Fill In – Name, Role>

POC: Logistics, Software Engineering, System Engineering, Program Management
DID: DI-IPSC-81443 A/T **Frequency**: Phase B, C, D: CDR, Build Review, TRR per build

Justification for Requiring the CDRL Item:
- Provides the instructions for operators to use for ground and simulation software in the operational environment (also known as a Positional Handbook)
- Required by Logistics for Air Force programs
- Essential for operator training
- Necessary for use by engineers during simulations and testing and by operators during operations

Impact to Program if Not Delivered:
- Lack of information necessary for operator training, resulting in critical mission operation errors
- Lack of information for the operators about how to execute the software during operations
- Lack of information necessary for operations troubleshooting

Software Version Description (SVD)
OPR: <Fill In – Name, Role>

POC: Software Engineering, System Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-81442 A/T **Frequency**: Phase B, C, D: Per Software Delivery

Justification for Requiring the CDRL Item:

- Documents the configuration of software releases
- Provides installation and adaptation instructions
- Essential for installing a software release and controlling the software configurations in an operational facility
- Provides necessary information for reproducing the version and solving operational problems
- *Mandatory for aviation safety software assurance (includes DO-278/DO-178B required Software Configuration Index (SCI))*

Impact to Program if Not Delivered:

- Lack of information needed to install and checkout software in an operational facility
- Higher probability of unknown software configuration
- *Unable to meet software civil aviation safety assurance configuration management requirements*

9.2 Software Reliability CDRL Item Justifications

Please contact the software reliability experts (See **Section 13**, Resources) for assistance with justifications for these software reliability CDRL items:

- Software Reliability Plan
- Software Reliability Case

9.3 Unique Hardware or Firmware CDRL Item Justifications

Please contact the software acquisition experts (See **Section 13**, Resources) for assistance with justifications for these special CDRL items:

- Firmware
  - Firmware Support Manual (FSM)
- Unique Hardware
  - Computer Operation Manual (COM)
  - Computer Programming Manual (COM)

9.4 Aviation Safety CDRL Item Justifications

Justifications for the following aviation safety CDRL items are included in this section, as shown in alphabetical order:

Please contact the software aviation safety experts (See **Section 13**, Resources) for assistance with justifications for these special CDRL items:

- MSO-C145 - for user equipment
  Note: Different parts of this CDRL are due at different times
- Aviation Operational Safety Assessment (AOSA) – for ground or space systems
- Aviation Preliminary System Safety Assessment (APSSA) – for ground or space systems
- Aviation System Safety Assessment (ASSA) – for ground or space systems

Please contact the software aviation safety experts (See **Section 13**, Resources) for assistance with justifications for these other aviation safety CDRL items:

- Aviation Safety for User Equipment
  - Plan for Software Aspects of Certification (PSAC)
  - Aviation Software Accomplishment Summary (ASAS)
  - Software Configuration Identification (SCI)

- Aviation Safety for Ground or Space Systems
  - Aviation Safety Assurance Plan (ASAP)
  - Aviation Functional Hazard Assessment (AFHA)
  - Aviation Operational Safety Assessment (AOSA) – for ground or space systems
  - Aviation Preliminary System Safety Assessment (APSSA) – for ground or space systems
  - Aviation System Safety Assessment (ASSA) – for ground or space systems

Table 9.4-1: Aviation Safety CDRL Items

User Equipment
MSO C-145, which includes: - Plan for Hardware Aspects of Certification (PHAC) - Plan for Software Aspects of Certification (PSAC) - Aviation Software Accomplishment Summary (ASAS)
Software Configuration Identification (SCI) – This is can be tailored into the SVD.
Ground or Space
Aviation Safety Assurance Plan (ASAP), which includes: - Plan for Hardware Aspects of Certification (PHAC) - Plan for Software Aspects of Certification (PSAC)
Aviation Functional Hazard Assessment (AFHA)
Aviation Operational Safety Assessment (AOSA)
Aviation Preliminary System Safety Assessment (APSSA)
Aviation System Safety Assessment (ASSA)
Artifacts to Support Aviation Safety Certification - Aviation Software Accomplishment Summary (ASAS)

MSO-C145 Certification Package (MSO-C145)
OPR: <Fill In – Name, Role>

POC: Software Engineering, Systems Engineering, Program Management, *Aviation Safety*
DID: DI-MISC-80508 B/T **Frequency**: Phase A: SDR
Phase B, C, D: PDR, CDR, Per delivery

Justification for Requiring the CDRL Item:
- All flight hardware and software is required to be certified to MSO-C145
- MSO-C145 prescribes the minimum assurance level standards that <Fill In; e.g., specific user equipment> must meet

Impact to Program if Not Delivered:
- System will not be certifiable for civil aviation applications unless documentation in certification package is provided.

Note: this applies only to user equipment installed in DoD aircraft

Aviation Operational Safety Assessment (AOSA)
OPR: <Fill In – Name, Role>

POC: Systems Engineering, Software Engineering, Program Management, *Aviation Safety*
DID: DI-IPSC-80508 B/T **Frequency**: Phase A: SRR, SDR,
Phase B, C, D: PDR, Revisions as needed

Justification for Requiring the CDRL Item:
- Documented validation of segment requirements related to civil aviation
- Approval of AOSA by certification/approval authority reduces or removes the risk of late imposition of additional requirements

Impact to Program if Not Delivered:
- System will not be certifiable for civil aviation applications
- Requirements may be omitted and system may not be certifiable

Aviation Preliminary System Safety Assessment (APSSA)
OPR: <Fill In – Name, Role>

POC: Systems Engineering, Software Engineering, Program Management, *Aviation Safety*
DID: DI-MISC-80508 B/T **Frequency**: Phase A: SDR
Phase B, C, D: PDR, Revisions as needed

Justification for Requiring the CDRL Item:
- Required by compliance document (ARP 4754)
- Includes Fault Tree Analysis and other probabilistic analyses (Reliability Block Diagram, Markov) as well as lower level functional hazard analyses depending on level of criticality

Impact to Program if Not Delivered:
- System will not be certifiable for civil aviation applications

Aviation System Safety Assessment (ASSA)
OPR: <Fill In – Name, Role>

Secondary POC: Systems Engineering, Software Engineering, Program Management, *Aviation Safety*
DID: DI-MISC-80508 B/T **Frequency**: Phase A: SDR
Phase B, C, D: PDR, CDR, FQT + 30 CD, Revisions as needed

Justification for Requiring the CDRL Item:
- Required by compliance document (ARP 4754).
- Includes updated results of PSSA as well as Failure Modes and Effects Analyses

Impact to Program if Not Delivered:
- System will not be certifiable for civil aviation applications

10. Software CDRL Item 1423 Forms

This section contains completed 1423 forms for the software CDRL items stated below.

- Software CDRL Item Tailoring
- Software Reliability CDRL Item Tailoring (future addition)
- Special Case CDRL Item Tailoring
  - Aviation Safety CDRL Item Tailoring (future addition)

The 1423 forms contain the tailoring instructions for the DID, the delivery instructions, and the approval coding. The following conventions are observed:
1. The common name of the CDRL item is bolded, regardless of the title of the DID.
2. <Yellow highlights> indicate a portion that has to be filled in or modified for the specific program.

The following pages contain the 1423 forms for the software CDRL items. These 1423 forms for the software CDRL items are provided below in alphabetical order by name:

- Interface Requirements Specification (IRS-E) – Interfaces External to the Contract Scope
- Interface Requirements Specification (IRS-I) – Interfaces Internal to the Contract Scope
- Software Architecture Description (SAD)
- Software Development Plan (SDP)
- Software Master Build Plan (SMBP)
- Software and System Measurement Report (SSMR)
- Software Product Specification (SPS)
- Software Requirements Specification (SRS)
- Software Test Description (STD)
- Software Test Plan (STP)
- Software Test Report (STR)
- Software Transition Plan (STrP)
- Software User Manual (SUM)
- Software Version Description (SVD)

Please contact the software acquisition experts (See **Section 13**, Resources) for assistance with tailoring the following CDRL items:

- Database Design Description (DBDD)
  The DBDD describes the constants database and the procedures for loading on board constants for testing and operations. It is a very important CDRL item. Many programs have had problems with the constants database and had problems with keeping the configuration under control. A future revision of this TOR is planned to contain a tailored version of the DBDD for onboard constants.

- Software Resources Data Reporting: Initial Developer Report and Data Dictionary (SRDR) – Initial
- Software Resources Data Reporting: Final Developer Report and Data Dictionary (SRDR) – Final

Interface Requirements Specification – External (IRS-E)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:		
	A	TDP X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3 SUBTITLE
	Interface Requirements Specification (IRS)	**Interface Requirements Specification – External (IRS-E)**

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6 REQUIRING OFFICE
DI-IPSC-81434A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	See CDRL Distribution Report

16. REMARKS

BLK 4:

1. In DI-IPSC-81434A, tailor as follows. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item". Contractor format is acceptable.
2. The Interface Requirements Specification – External (IRS-E) specifies the interface requirements imposed externally to the contract on one or more <systems>, <segments>, hardware items (HIs), software items (SIs), manual operations, or other <system> components to achieve one or more interfaces among these entities. An IRS-E can cover any number of interfaces. An IRS-E can be used to supplement the System/Subsystem Specification (SSS) and Software Requirements Specification (SRS) as the basis for design and qualification of testing of <system> and software items.
3. One or more IRS-Es shall cover all interfaces between the <Fill In – Program Name> and any external entities.
4. Organization of interfaces into one or more IRS-Es is at the discretion of the contractor.
5. One or more IRS-Es shall cover all software item-to-software item interfaces and software item-to-hardware item interfaces for all software items in the following categories of software (including the software portion of firmware):

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

a. onboard software (e.g., spacecraft, communications, payload); and
b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
c. other software (e.g., software for training; <database support including data to be uploaded to the space vehicle>) to be:
    1) delivered to the customer; or
    2) used in satisfying, verifying, or validating requirements; or
    3) used in performing or supporting operations; or
    4) used in performing or supporting sustainment.

<Note: If the database interface crosses the contract boundary, e.g., Space Segment contract to Ground Segment contract, include the phrase "database support including data to be uploaded to the space vehicle" above. If both <segments> are inside the same contract, use that phrase in the IRS-I.>

<Note: If the interface crosses the contract boundary, e.g., Space Segment contract to Ground Segment contract, then use the IRS-E.
If both <segments> are inside the same contract, then use the IRS-I.>

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8:

1. Government approval/disapproval/comments 45 CD after receipt.
2. Approval shall be by contract modification.

BLKs 10, 12, and 13:

<For Phase A:>

1. Draft shall be submitted 45 CD before SRR.
2. Preliminary shall be submitted 45 CD before SDR.
3. Updates incorporating Government comments shall be submitted 30 CD after SRR and SDR, respectively.

See continuation page

BLKs 10, 12, and 13 continued:

<For Phase B, C, and D:>

1. For incremental software life cycle:
   a. Preliminary shall be submitted 45 CD before PDR.
   b. Final shall be submitted 45 CD before CDR for approval <and authentication>.
      <Note: Insert "<and authentication>." only if these external interfaces are at the first or second level of the contract.>
   c. Updates incorporating Government comments shall be submitted 30 CD after PDR and CDR, respectively.
   d. Updates shall be submitted as significant changes occur or by PCO direction.

<Note: Insert the following 2 paragraphs only if "<and authentication>" was used above.>

   e. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.
   f. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

2. For evolutionary software life cycle:
   a. Preliminary shall be submitted 45 CD before PDR.
   b. Updates shall be submitted 45 CD before CDR.
   c. Final shall be submitted 45 CD before each software build requirements review for approval <and authentication>.
      <Note: Insert "<and authentication>." above only if these external interfaces are at the first or second level of the contract.>
   d. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and each software build requirements review, respectively.
   e. Updates shall be submitted as significant changes occur or by PCO direction.

See continuation page

BLKs 10, 12, and 13 continued:

<Note: Insert the following 2 paragraphs only if "<and authentication>" was used above.>

f. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.

g. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

End of Interface Requirements Specification – External (IRS-E) Instructions

Interface Requirements Specification – Internal (IRS-I)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:		
	A	TDP	X TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3 SUBTITLE
	Interface Requirements Specification (IRS)	**Interface Requirements Specification – Internal (IRS-I)**

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6 REQUIRING OFFICE
DI-IPSC-81434A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	See CDRL Distribution Report

16. REMARKS

BLK 4:

1. In DI-IPSC-81434A, tailor as follows. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item". Contractor format is acceptable.
2. The Interface Requirements Specification – Internal (IRS-I) specifies the internal interface requirements within the contract on one or more <systems>, <segments>, hardware items (HIs), software items (SIs), manual operations, or other <system> components to achieve one or more interfaces among these entities. An IRS-I can cover any number of interfaces. An IRS-I can be used to supplement the System/Subsystem Specification (SSS) and Software Requirements Specification (SRS) as the basis for design and qualification of testing of <system> and software items.
3. One or more IRS-Is shall cover all interfaces within the <Fill In – Program Name>.
4. Organization of interfaces into one or more IRS-Is is at the discretion of the contractor.
5. One or more IRS-Is shall cover all software item-to-software item interfaces and software item-to-hardware item interfaces for all software items in the following categories of software

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

(including the software portion of firmware):

a. onboard software (e.g., spacecraft, communications, payload);

b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and

c. other software (e.g., software for training; <database support including data to be uploaded to the space vehicle>) to be:

1) delivered to the customer; or

2) used in satisfying, verifying, or validating requirements; or

3) used in performing or supporting operations; or

4) used in performing or supporting sustainment.

<Note: If the database interface is within the contract, include the phrase "database support including data to be uploaded to the space vehicle" above in the IRS-I. If the database interface crosses the contract boundary, e.g., Space Segment contract to Ground Segment contract, use that phrase within the IRS-E.>

<Note: If the interface crosses the contract boundary, e.g., Space Segment contract to Ground Segment contract, then use the IRS-E. If both <segments> are inside the same contract, then use the IRS-I.>

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8:

1. Government approval/disapproval/comments 45 CD after receipt.

<Note: The following clause is inserted only if software is at the first or second level of the contract.>

2. Approval shall be by contract modification.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. For waterfall or incremental software life cycle:

See continuation page.

BLKs 10, 12, and 13 continued:

a. Preliminary shall be submitted 45 CD before PDR.
b. Final shall be submitted 45 CD before CDR for approval <and authentication>.
<Note: Insert "<and authentication>" above only if software is at the first or second level of the contract.>
c. Updates shall be submitted 45 CD before each software build requirements review.
d. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and each software build requirements review, respectively.
e. Updates shall be submitted as significant changes occur or by PCO direction.
<Note: Insert the following 2 paragraphs only if "<and authentication>" was used above.>
f. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.
g. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

2. For evolutionary software life cycle:
a. Preliminary shall be submitted 45 CD before PDR.
b. Update shall be submitted 45 CD before CDR.
c. Final shall be submitted 45 CD before each software build requirements review for approval <and authentication>.
<Note: Insert "<and authentication>" above only if software is at the first or second level of the contract.>
d. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and each software build requirements review, respectively.
e. Updates shall be submitted as significant changes occur or by PCO direction.

See continuation page.

BLKs 10, 12, and 13 continued:

<Note: Insert the following paragraph only if "<and authentication>" was used above.>

f. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.

g. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

End of Interface Requirements Specification - Internal (IRS-I) Instructions

Software Architecture Description (SAD)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER MISC

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Technical Report-Study/Services	**Software Architecture Description (SAD)**

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MISC-80508B/T	<<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
NR	D		BLK 16	

16. REMARKS:

BLK 4: In DI-MISC-80508B tailor as follows. Contractor format is acceptable.

1. Delete all references to DTIC.
2. The Software Architecture Description (SAD) documents multiple perspectives of the software architecture.
3. A single SAD shall cover all software items in the following categories of software (including the software portion of firmware):
   a. Onboard software (e.g., spacecraft, communications, payload); and
   b. Ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. Other software (e.g., software for training; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or
      2) used in satisfying, verifying, or validating requirements; or
      2) used in performing or supporting operations; or
      3) used in performing or supporting sustainment.
4. Software Architecture Requirements:
   Architecture and Design.

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

a. The software architecture shall be component based, meaning the architecture will consist of a collection of components with well defined interface and service semantics that operate over an underlying infrastructure.
b. The software architecture shall be consistent with the <system> architecture and design.
c. The software architecture representation shall cover multiple architecture perspectives, including both models and detailed textual descriptions of the logical organization, dynamic behavior, process decomposition, software organization, and physical realization of the software.
d. The software architecture representation shall document the software components, their semantics, the interfaces (data and control) among them, and external software-software and software-hardware interfaces.
e. The software architecture representation shall be internally consistent.
f. Use of graphical architecture modeling techniques, e.g., Unified Modeling Language (UML), is required.
g. Use of software engineering tools and techniques for representing, documenting, and analyzing the software architecture, including consistency analysis and requirements mapping to the architecture is required.
h. The software architecture representation shall be developed in accordance with the detailed methods, techniques, and tools specified in the contractor team's Software Development Plan (SDP).
i. The software architecture level of detail shall evolve from high level architecture components and interfaces to lower level components and interfaces that transition to the software design.

5. The Software Architecture Description shall include:
   a. A high-level description and diagram(s) of the software architecture.
   b. A description of how the software architecture integrates into the <system> architecture.

See continuation page

BLK 4 continued:

c. Significant driving requirements and their impact on the architecture.
d. Architecture style(s), layers, and constraints being used.
e. A detailed description, expressed in a set of use cases (or equivalent), of how the software will interact with the users and with other <systems>.
f. A representation of the architecture that models abstract (or logical) architecture components and interfaces. This logical architecture representation shall indicate the functionality and key software interfaces associated with each logical component of the <system>, including dependency relationships. All diagrams shall be accompanied by descriptions of the functionality and services provided by the components.
g. Dynamic Behavior:
    1) Diagrams that show the component interactions and collaborations required by each use case (or equivalent).
    2) Sequencing of component interactions.
    3) States and modes, and transitions among them.
h. Process information:
    1) A mapping of high level processes to <system> components.
    2) An enumeration and description of executable processes and a mapping between software components and the executable processes.
i. A description and diagrams of how the software components are organized from a development viewpoint.
j. Physical Information:
    1) Diagrams that show the computer system hardware architecture, with textual descriptions, and a description of the purpose of each hardware component and its interfaces, and hardware physical processing characteristics (e.g., CPU throughput, memory, bandwidth).
    2) A mapping of the software architecture components to the physical hardware on which the implementation of those components will reside.

See continuation page.

BLK 4 continued:

k. A bi-directional mapping of the software and interface requirements to software architecture components and use cases (or equivalent).

l. Identification of commercial item software products that are expected to implement part or all of specific software architecture components:
   1) Relationship of each commercial item to the software architecture component(s) it implements and whether it is partial or complete implementation.
   2) Rationale for choice of commercial item products and specific commercial item products. ("Commercial item" is commonly known as "Commercial-Off-The-Shelf" or "COTS".)

m. Identification of reuse software components (and any others with limited data rights) that are expected to implement specific software architecture component(s) or portions thereof:
   1) Relationship of each reuse component to the software architecture component(s) it implements, and whether it is partial or complete implementation.
   2) For each reuse component, description of what is being reused (design, algorithms, code), and the magnitude of expected modifications to the reuse software component.
   3) Rationale for reuse and choice of specific reuse components.

n. Description of how and where the architecture supports Modular Open Software Architecture (MOSA) principles. (For more information see http://www.acq.osd.mil/osjtf/mosapart.html). <Verify URL before issuing 1423.>

o. Architecture-wide design decisions that are not covered by the above items. Examples include the following:
   1) Applicable standards (e.g., interface standards, open system standards, graphical user interface (GUI) standards)
   2) Application Program Interfaces (APIs) to be used
   3) Uniform exception handling and recovery methods
   4) Uniform data storage and access methods
   5) Algorithms to be used

See continuation page

BLK 4 continued:

6) Response times, reliability, maintainability, and availability or other performance characteristics not allocated to individual architecture components
7) A description of major architecture trade-offs performed and rationale for decisions.

6. Electronic versions of the software architecture representations shall also be delivered via this CDRL item in addition to the diagrams and descriptions provided in this report. The report shall be in a format to which the Government and the contractor have mutually agreed to ensure that the software architecture representations are usable by the Government.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 45 CD after receipt.

BLKs 10, 12, and 13:

1. Updated or archived artifacts shall be delivered as specified in Section H of the contract <Fill In - e.g., H0xx Electronic Data Interchange Network>.

<For Phase A:>

2. Draft shall be submitted 45 CD before SDR.

<For Phase B, C, and D incremental and evolutionary software life cycles:>

2. Updated draft shall be submitted 30 CD after ATP.
3. Preliminary shall be submitted 45 CD before PDR.
4. Updates shall be submitted 45 CD before CDR
5. Final shall be submitted 45 CD before each software build architecture review.
6. Updates incorporating Government comments shall be submitted 105 CD after ATP, 30 CD after PDR, CDR, and each software build architecture review, respectively.

See continuation page

BLKs 10, 12, and 13 continued:

7. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Architecture Description (SAD) Instructions

Software Development Plan (SDP)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP	X	TM	OTHER	MISC
	A					

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Development Plan (SDP)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81427A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	

16. REMARKS:

BLK 4: In DI-IPSC-81427A, contractor format is acceptable.

1. The Software Development Plan (SDP) describes a developer's plans for conducting a software development effort. The term "software development" is meant to include new development, modification, reuse, reengineering, incorporation of commercial item (also known as COTS) packages, maintenance, and all other activities resulting in software products. The SDP provides insight into, and a tool for monitoring the processes to be followed for software development, the methods to be used, the approach to be followed for each activity, and project schedules, organization, and resources.
2. The SDP shall comply with Aerospace Report No. TOR-2004(3909)-3537, "Software Development Standard for Space Systems", <Fill In With Latest Revision or Date>, as tailored for this contract. Hereinafter, "Standard" refers to this standard, as tailored for this contract.
3. The SDP shall be an integrated plan covering the software development activities for all "significant software team members" as defined in 1.2.2 of the Standard throughout the <Fill In – Program Name> development.

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

4. A single SDP shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle; automatic test equipment; test facility and environment; and maintenance) to be:
      1) delivered to the customer; or
      2) used in satisfying, verifying, or validating requirements; or
      3) used in performing or supporting operations; or
      4) used in performing or supporting sustainment.
5. The SDP shall identify all software (including custom, commercial items, reused) developed or modified by foreign contractors at any level (e.g., prime, subcontractors, other significant software team members, or vendors) that will be delivered to the Government. The SDP shall identify the foreign contractor's company name and foreign location(s). A "foreign contractor" means any foreign corporation, business association, partnership, trust, society or any other entity or group that is not incorporated or organized to do business in the United States, as well as international organizations, foreign governments and any agency or subdivision of foreign governments (e.g., diplomatic missions).
6. Section 4.2.5.4 of the SDP shall comply with <the "Military Standard Reliability Program for Systems and Equipment", MIL-STD-785B>, <Fill In With Latest Revision or Date>, for ground systems and <the "Military Standard Reliability Program Requirements for Space and Launch Vehicles", MIL-STD-1543>, <Fill In With Latest Revision or Date>, for space systems, each as tailored for this contract.

See continuation page.

BLK 4 continued:

7. In DI-IPSC-81427A/T tailor as follows:
   a. Delete paragraph 4, Content, (of DI-IPSC-81427A) in its entirety and replace with Appendix H, Software Development Plan Template, of the Standard, as tailored for this contract.
   b. Appendix H of the Standard shall be followed for paragraph numbering, titles and content.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government approval/disapproval/comments 45 CD after receipt.

BLKs 10, 12 and 13:

<For Phase A:>

1. Draft shall be submitted 45 CD before SRR.
2. Final shall be submitted for approval 45 CD before SDR.
3. Updates incorporating Government comments shall be submitted 30 CD after SRR and CDR, respectively.
4. Updates shall be submitted as significant changes occur or by PCO direction.

<For Phase B, C, and D:>

1. Final shall be submitted for approval 30 CD after ATP.
2. Updates incorporating Government comments shall be submitted 105 CD after ATP.
3. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Development Plan (SDP) Instructions

Software Master Build Plan (SMBP)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER MISC

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Technical Report-Study/Services	**Software Master Build Plan (SMBP)**

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MISC-80508B/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
NR	D		BLK 16	See CDRL Distribution Report

16. REMARKS:

BLK 4: In DI-MISC-80508B tailor as follows. Contractor format is acceptable.

1. Delete all references to DTIC.
2. The SMBP includes plans for integration and verification of the software consistent with the software life cycle model(s).
3. A single Software Master Build Plan (SMBP) shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. Other software (e.g., software for training; database support including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or
      2) used in satisfying, verifying, or validating requirements; or
      3) used in performing or supporting operations; or
      4) used in performing or supporting sustainment.

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

4. The SMBP shall include plans for integration and verification of the builds consistent with the software life cycle model(s), as defined in the Software Development Plan.
5. The SMBP shall define the hierarchy(ies) of software integration stages and the software requirements verification events in the integration hierarchy(ies) (i.e., the specific integration stages at which requirements verification will occur).
6. The SMBP shall include the allocation of software components and software requirements to integration stages (e.g., increments, builds) and the allocation of software requirements to verification events.
7. The SMBP shall also include integration and verification schedules and the responsibilities for and location of each integration stage and verification event in the integration hierarchy.
8. (The SMBP is sometimes known as the Master Software Integration and Verification Plan.)

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Preliminary shall be submitted 45 CD before PDR.
2. Final shall be submitted 45 CD before CDR.
3. Updates shall be submitted 45 CD before each software build design review.
4. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and software build requirements review, respectively.
5. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Master Build Plan (SMBP) Instructions

Software and System Measurement Report (SSMR)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / peer reviews NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Technical Report-Study/Services	**Software and <System> Measurement Report (SSMR)**

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MISC-80508B/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report

8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION	
NR	D	BLK 16	BLK 16	

16. REMARKS:

BLK 4: In DI-MISC-80508B tailor as follows. Replace requirements section with the following.

1. The software and <system> measurement report is an integrated report covering the software and <system> development activities.
2. Contractor format is acceptable.
3. Delete all references to DTIC.
4. A single Software and <System> Measurement Report (SSMR) shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or
      2) used in satisfying, verifying, or validating requirements; or

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

3) used in performing or supporting operations; or

4) used in performing or supporting operations or sustainment.

5. The Government shall have electronic access to copies of the Contractor's and all other team member's measurement data in a format to which the Government has agreed.

6. "Practical Software and System Measurement", Version **4.0b1** or later, shall be used as a guide.

7. Software measurements reported, at a minimum, shall include these measurements by software item, and by build:

a. Planned and actual items:

1) Software size (for reuse, modified, and new code)

2) Software development effort (by activity type, e.g., software requirements, software architecture, software design, coding, unit test, unit integration and testing, software qualification testing)

3) Software development schedule (showing begin and end dates for milestones and for activity types)

4) Software development staffing and turnover (by personnel type)

5) Software progress (by activity type, e.g., software requirements, software architecture, software design, coding, unit test, unit integration and testing, software qualification testing)

6) Computer hardware resources utilization (See paragraph 4.2.6 of the Software Development Standard for Space Systems, Aerospace TOR-2004(3909)-3537.)

7) Build requirements volatility (planned and actual number of software requirements implemented in each build)

8) Requirements traced to NDI (by COTS and by reuse)

9) Requirements verified (matching required results)

b. Actual (also by software item, by build):

1) Software requirements volatility (additions, deletions, and modifications per reporting period)

See continuation page

BLK 4 continued:

2) Software defects from peer reviews (by activity type, by defect type)
3) Software problem reports (total number, number closed, number opened per reporting period, age, severity, activity type, problem type)
4) Rework effort (resources expended to replace or revise software products after they have passed their in-phase quality gate)
5) Software earned value: Budgeted Cost of Work Scheduled (BCWS); Budgeted Cost of Work Performed (BCWP); Actual Cost of Work Performed (ACWP); Cost Variance; Schedule Variance.

8. Systems engineering measurements reported, at a minimum, shall include these measurements by <element>, <subsystem>, , and <system>, and by increment:
   a. Planned and actual items:
      1) Number of requirements
      2) Number of external interfaces
      3) Number of internal interfaces
      4) System development effort (by activity type, e.g., system requirements, system architecture, system design, implementation, integration and testing, system qualification testing)
      5) System development schedule (showing begin and end dates for milestones and for activity types)
      6) System development staffing and turnover (by personnel type)
      7) System progress (by activity type, e.g., system requirements, system architecture, system design, implementation, integration and testing, system qualification testing)
      8) Requirements traced to Non-development Item (NDI) (by COTS and by reuse)
      9) Requirements verified (matching required results)
   b. Actual (also by <element>, <subsystem>, , and <system>, and by increment):
      1) Requirements volatility (additions, deletions, and modifications per reporting period)

See continuation page

BLK 4 continued:

2) Defects found in <system>, , <subsystem>, <element> peer reviews (by activity type, by defect type)
3) Technical interchange, review, meeting action items (total number, number closed, number opened per reporting period, age, priority, activity type, problem type)
4) Problem reports (total number, number closed, number opened per reporting period, age, severity, activity type, problem type)
5) Rework effort (resources expended to replace or revise products after they have passed their in-phase quality gate)

9. It is expected that the contractor's measurement program may include additional measurements beyond those listed above. Any additional measurements shall be made available to the Government via electronic access (EDIN).
10. Each SSMR report shall be an integrated report covering the software development activities for all software and <system> team members (i.e., any internal or external organization supporting or performing software development or test including support provided through informal and formal agreements and contracts) throughout the <Fill In – Program Name> development.
11. Provide monthly SSMRs as described in the Software Development Plan and System Engineering Management Plan. Provide explanations and interpretations of reported measurement data, including deviations from expected or projected values and breaches of thresholds, as well as any corrective actions being undertaken.
12. The set of measures collected and reported are expected to vary Because the life cycle activities vary over time. The contractor shall allow for future measures identified by the Government that are not specifically identified in this text.

See continuation page

BLK 5 continued:

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 45 CD after receipt.

<For Phase A, B, C, and D:>

1. Submittals shall be the 15th of each month for measurement data as of the end of the previous month, beginning with the first month ATP, whether it is a full month or not.

End of Software and System Measurement Report (SSMR) Instructions

Software Product Specification (SPS)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Product Specification (SPS)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81441A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	

16. REMARKS:

BLK 4: In DI-IPSC-81441A/T, tailor as follows. Contractor format is acceptable.

1. The SPS contains or references the executable software, source files, and software support information, including "as built" design information and compilation, build, and modification procedures, for a software item. The SPS can be used to order the executable software and source files for a software item and is the primary software support document for the software item.
2. One or more Software Product Specifications (SPSs) shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or
      2) used in performing or supporting operations or
      3) used in performing or supporting sustainment.

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

3. The Contractor may organize an individual SPS to cover a group of software items rather than having separate SPSs for each software item.
4. Section 3.2 regarding delivery of source files in the referenced DID does not apply to commercial item (COTS) products if the source file information is not available to the contractor.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government approval/disapproval/comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Preliminary shall be submitted 60 CD before each software build delivery for operations or maintenance.
2. Final incorporating Government comments shall be submitted for approval 60 CD after each software build delivery for operations or maintenance.
3. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Product Specification (SPS) Instructions

Software Requirements Specification (SRS)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor - Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Requirements Specification (SRS)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81433A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	

16. REMARKS:

BLK 4:

1. In DI-IPSC-81433A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item".
2. The Software Requirements Specification (SRS) specifies the requirements for a software item and the methods to be used to ensure that each requirement has been met.
3. Software Requirements Specifications (SRSs) shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or
      2) used in satisfying, verifying, or validating requirements; or
      3) used in performing or supporting operations; or
      4) used in performing or supporting sustainment.

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

4. Requirements pertaining to a software item's external interfaces may be presented in the SRS or in one or more Interface Requirements Specifications (IRSs) (DI-IPSC-81434A) referenced from the SRS.
5. Paragraph 3.3: Delete first sentence and replace second sentence with the following:
   "This paragraph shall reference one or more Interface Requirements specifications (IRSs) or other documents containing the requirements for the software item's external interfaces."
6. Delete paragraphs 3.3.1 and 3.3.x. However, the contents of these paragraphs may be used for internal interfaces, as referenced in paragraph 3.4.
7. Paragraph 3.11 shall include reliability requirements, as appropriate.
8. Paragraphs 3.3.x.f, 3.3.x.f.4, 3.4, 3.7 and 3.11 shall include requirements for abnormal conditions, as appropriate.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8:

1. Government approval/disapproval/comments 45 CD after receipt.

<Note: The following clause is inserted only if software is at the first or second level of the contract.>

2. Approval shall be by contract modification.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. For incremental software life cycle:
   a. Preliminary shall be submitted 45 CD before PDR.
   b. Final shall be submitted 45 CD before CDR for approval <and authentication>.
      <Note: Insert "<and authentication>" above only if software is at the first or second level of the contract.>
   c. Updates incorporating Government comments shall be submitted 30 CD after PDR and CDR, respectively.

See continuation page.

BLKs 10, 12, and 13 continued:

<Note: Insert the following 2 paragraphs only if "<and authentication>" was used above.>

d. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.

e. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

2. For evolutionary software life cycle:

a. Preliminary shall be submitted 45 CD before PDR.

b. Updates shall be submitted 45 CD before CDR.

c. Final shall be submitted 45 CD before each software build requirements review for approval <and authentication>. <Note: Insert "<and authentication>" only if software is at the first or second level of the contract.>.

d. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and each software build requirements review, respectively.

e. Updates shall be submitted as significant changes occur or by PCO direction.

<Note: Insert the following 2paragraphs only if "<and authentication>" was used above.>

f. Previously authenticated specifications shall be revised and submitted for authentication when 10% of the specification has been changed, when a change affects a major portion of the specification, by PCO direction, or by mutual agreement.

g. All submittals for authentication shall include the original hardcopy of the document's title page signed by the contractor representative(s) and ready for Government signature.

End of Software Requirements Specification (SRS) Instructions

Software Test Description (STD)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 12 15 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/peer reviews No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Test Description (STD)	<Fill In>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81439A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
NR	D		BLK 16	See CDRL Distribution Report

16. REMARKS:

BLK 4:

1. In DI-IPSC-81439A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with “software item”. The use of the word ‘test’ throughout the DID and this tailoring includes all verification methods (i.e., Inspection (I), Analysis (A), Demonstration (D), and Test (T)).
2. The Software Test Description (STD) describes the test preparations, test cases, and test procedures to be used to perform qualification testing performed on a software item, or a software system or segment. The STD enables the assessment of the adequacy of the qualification testing to be performed.
3. There shall be one or more Software Test Descriptions (STDs) for each software delivery.
4. A unified STD may be provided for multiple software items according to the integration and verification strategy (Software Master Build Plan) rather than having separate ones for each software item.
5. STDs shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload); and

See Continuation Page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

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BLK 4 continued:

b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and

c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:

1) delivered to the customer; or
2) used in satisfying, verifying, or validating requirements; or
3) used in performing or supporting operations; or
4) used in performing or supporting sustainment.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Preliminary shall be submitted 45 CD before each software build design review
2. Final shall be submitted 105 CD before Software TRR for start of qualification testing for each software build.
3. Final incorporating Government comments shall be submitted 30 CD before software TRR for start of software qualification testing for each software build.
4. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Test Description (STD) Instructions

Software Test Plan (STP)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:		
	A	TDP X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Test Plan (STP)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81438A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	See CDRL Distribution Report

16. REMARKS:

BLK 4:

1. In DI-IPSC-81438A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item". The use of the word 'test' throughout the DID and this tailoring includes all verification methods (i.e., Inspection (I), Analysis (A), Demonstration (D), and Test (T)).
2. The Software Test Plan (STP) describes the plans for qualification testing of software items and software systems. It describes the software test environment to be used for the testing, identifies the tests to be performed, and provides schedules for test activities. The STP enables the assessment of the adequacy of planning for software item and software system qualification testing.
3. There shall be one or more Software Test Plans (STPs) for each software delivery.
4. A unified STP may be provided for multiple software items according to the integration and verification strategy (Software Master Build Plan) rather than having separate ones for each software item.
5. STPs shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload);

See Continuation Page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and

c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:

1) delivered to the customer; or

2) used in satisfying, verifying, or validating requirements; or

3) used in performing or supporting operations; or

4) used in performing or supporting sustainment.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government approval/disapproval/comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Preliminary shall be submitted 45 CD before PDR.
2. Final shall be submitted for approval 45 CD before CDR.
3. Updates shall be submitted 45 CD before each software build requirements review.
4. Updates shall be submitted 105 CD before each software build TRR.
5. Updates incorporating Government comments shall be submitted 30 CD after PDR, CDR, and each software build requirements review, and 30 CD before each software build TRR, respectively.
6. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Test Plan (STP) Instructions

Software Test Report (STR)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Test Report (STR)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81440A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	See CDRL Distribution Report

16. REMARKS:

BLK 4:

1. In DI-IPSC-81440A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with “software item”. The use of the word ‘test’ throughout the DID and this tailoring includes all verification methods (i.e., Inspection (I), Analysis (A), Demonstration (D), and Test (T)).
2. The Software Test Report (STR) is a record of the qualification testing performed on a software item, a software system or segment, or other software-related item. The STR enables the assessment of the testing and its results.
3. There shall be one or more Software Test Reports (STRs) for each software delivery.
4. A unified STR may be provided for multiple software items according to the integration and verification strategy (Software Master Build Plan) rather than having separate ones for each software item.
5. STRs shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload);

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and

c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:

1) delivered to the customer; or

2) used in satisfying, verifying, or validating requirements; or

3) used in performing or supporting operations; or

4) used in performing or supporting sustainment.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 30 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Final shall be submitted for approval 30 CD after completion of software qualification testing for each software build.
2. Updates incorporating Government comments shall be submitted 75 CD after completion of software qualification testing for each software build.

End of Software Test Report (STR) Instructions

Software Transition Plan (STrP)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Transition Plan (STrP)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81429A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	

16. REMARKS:

BLK 4:

1. In DI-IPSC-81429A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item".
2. The Software Transition Plan (STrP) identifies the hardware, software, and other resources needed for life cycle support of deliverable software and describes the developer's plans for transitioning deliverable items to the <support organization>.
3. One unified STrP shall cover all software items for each software delivery.
4. The STrP(s) shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload);
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

2) used in performing or supporting operations; or
3) used in performing or supporting sustainment.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government approval/disapproval/comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Preliminary shall be submitted 45 CD before CDR.
2. Updates shall be submitted 45 CD before each software build design review and 45 CD before the software TRR for each build for delivery to maintenance.
3. Updates incorporating Government comments shall be submitted 30 CD after CDR, each software build design review, and software TRR, respectively.
4. Final shall be submitted for approval 105 CD before transition to maintenance.
5. Updates incorporating Government comments shall be submitted 30 CD before transition to maintenance.
6. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software Transition Plan (STrP) Instructions

Software User Manual (SUM)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software User Manual (SUM)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81443A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	See CDRL Distribution Report
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
A	D		BLK 16	

16. REMARKS:

BLK 4:

1. In DI-IPSC-81443A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item".
2. The Software User Manual (SUM) tells a hands-on software user how to install and use a software item, a group of related software items, or a software system or segment. It may also cover a particular aspect of software operation, such as instructions for a particular position or task.
3. A unified SUM may be provided for multiple software items according to the integration and verification strategy (Software Master Build Plan) rather than having separate ones for each software item.
4. One or more SUMs shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload);
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

1) delivered to the customer; or
2) used in satisfying, verifying, or validating requirements; or
3) used in performing or supporting operations; or
4) used in performing or supporting sustainment.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government approval/disapproval/comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Draft shall be submitted 45 CD before CDR.
2. Preliminary shall be submitted 45 CD before each software build design review.
3. Updated preliminary shall be submitted 105 CD before TRR for start of software Formal Qualification Test (FQT) for each software delivery for operations or maintenance.
4. Final shall be submitted for approval 60 CD after completion of FQT.
5. Updates shall be submitted for approval 60 CD before transition of each software build for operations or maintenance.
6. Updates incorporating Government comments shall be submitted 30 CD after CDR, 30 CD after each software build design review, 30 CD before each software TRR, 135 CD after each software FQT completion, and at transition of each software build to operations or maintenance, respectively.
7. Updates shall be submitted as significant changes occur or by PCO direction.

End of Software User Manual (SUM) Instructions

Software Version Description (SVD)

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)	Form Approved QMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information, Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:			
	A	TDP	X	TM	OTHER

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
<Fill In>	<Fill In>	RFP Contractor – Not Identified

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
	Software Version Description (SVD)	<Fill In or Leave Blank>

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-IPSC-81442A/T	<Fill In>	<Fill In>

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14 & 15. DISTRIBUTION AND TOTAL
<Fill In>		BLK 16	BLK 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	
NR	D		BLK 16	See CDRL Distribution Report

16. REMARKS:

BLK 4:

1. In DI-IPSC-81442A, tailor as follows. Contractor format is acceptable. Replace all references to "Computer Software Configuration Item" and "CSCI" with "software item".
2. The Software Version Description (SVD) identifies and describes a software version consisting of one or more software items. It is used to release, track, and control software versions.
3. There shall be one or more SVDs for each software delivery.
4. A unified SVD may be provided for multiple software items according to the integration and verification strategy (Software Master Build Plan) rather than having separate ones for each software item.
5. The SVDs shall cover all software items in the following categories of software (including the software portion of firmware):
   a. onboard software (e.g., spacecraft, communications, payload);
   b. ground operations software (e.g., mission planning; mission processing; mission support; telemetry, tracking and commanding; database software; infrastructure and services); and
   c. other software (e.g., software for training; modeling, simulation, and other analysis tools; database support, including data to be uploaded to the space vehicle) to be:
      1) delivered to the customer; or

See continuation page.

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE

BLK 4 continued:

2) used in satisfying, verifying, or validating requirements; or
3) used in performing or supporting operations; or
4) used in performing or supporting sustainment.

6. SVDs shall include commercial item software. (Commercial item software is commonly known as Commercial-Off-The-Shelf or COTS.)
7. <For aviation safety, include the following text:> SVDs shall include all information required to support aviation safety in accordance with RTCA/DO-178B, section 11.16, as appropriate.

BLK 5: <Fill In with SOW references here and state "BLK 16" in BLK 5 above or fill in SOW references in BLK 5 above.>

BLK 8: Government comments 45 CD after receipt.

BLKs 10, 12, and 13:

<For Phase B, C, and D:>

1. Final shall be submitted 60 CD before completion of each software build for delivery to operations or maintenance.
2. Update incorporating Government comments shall be submitted simultaneously with completion of each software build for delivery to operations or maintenance.
3. Update shall be submitted 60 CD before transition of each build to operations or maintenance.
4. Update incorporating Government comments shall be submitted simultaneously with transition of each software build for delivery to operations or maintenance.

End of Software Version Description (SVD) Instructions

10.1 Software Reliability CDRL Item 1423 Forms

Please contact the software reliability experts (see **Section 13**, Resources) for assistance with the 1423 for the following CDRL items:

- Software Reliability Plan
- Software Reliability Case

10.2 Software Special Case CDRL Item 1423 Forms

10.2.1 Unique Hardware or Firmware CDRL Item 1423 Forms

Please contact the software acquisition experts (See **Section 13**, Resources) for assistance with the 1423 for the following CDRL items:

- Unique Hardware
  - Computer Operation Manual (COM)
  - Computer Programming Manual (CPM)
- Firmware
  - Firmware Support Manual (FSM)

10.2.2 Software Aviation Safety CDRL Item 1423 Forms

Please contact the aviation safety experts (See **Section 13**, Resources) for assistance with the 1423 for the following CDRL items:

- Aviation Safety CDRL items for User Equipment
  - MSO-C145
  - Plan for Software Aspects of Certification (PSAC)
  - Aviation Software Accomplishment Summary (SAS)
  - Software Configuration Identification (SCI)
- Aviation Safety CDRL items for Ground or Space Systems
  - Aviation Functional Hazard Analysis (FHA)
  - Aviation Operational Safety Analysis (AOSA)
  - Aviation Preliminary System Safety Analysis (PSSA)
  - Aviation Safety Assurance Plan (ASAP)
  - Aviation System Safety Analysis (SSA)

11. Section H Clauses Related to CDRL Items

11.1 Electronic Data Interchange Network (EDIN)

SMC -- H0xx <PROJECT ID> ELECTRONIC DATA INTERCHANGE NETWORK (MMM 20XX)

a) During the <PROJECT ID> contract, the contractor shall provide continuously available, secure, encrypted remote access such that any authorized individual can view all documents, analyses, software (including but not limited to source code and make files) technical data, databases, or other information (hereinafter referred to collectively as data) using a standard web browser. The data shall be safeguarded at multiple levels, i.e., the Unclassified, Contractor Proprietary, and Secret levels in accordance with Government requirements and negotiated restrictions to rights in technical data or software. The contractor shall provide access to data generated by the contractor and all subcontractors at any tier. All remote access facilities and processes used to implement this access shall be referenced in the IMP and CSOW. The Contractor shall establish this access within 10 days of contract award and maintain this access to all draft and completed items on the Data Accession List (DAL) and the Contract Data Requirements List (CDRL) as well as all other working data (including software source code) developed to support the management and engineering efforts of the program. The Contractor shall keep all information current and make a copy of all data in support of a data requirement or data referenced in any e-mail message, discussion, telephone conversation, or formal presentation accessible to the Government within one week of such reference. All versions of any data shall remain accessible for the duration of the contract period of performance. The contractor shall provide access to all individuals authorized by Government.

b) The Contractor shall provide continuously available, secure, encrypted remote access to any data base or other data repository used to create the Software <and System | Segment> Measurement Report (SSMR), CDRL <A0xx> together with tools to remotely query, report, and display the data ("data mining" tools).

c) The Contractor shall provide continuously available, secure, encrypted remote access to any data base or other data repository used to create the Failure Reporting Analysis and Corrective Action System (FRACAS) Reports, CDRL <A0xx> together with tools to remotely query, report, and display the data ("data mining" tools).

d) The Contractor shall provide continuously available, secure, encrypted remote access to the Contractor's software architecture artifacts in a format to be agreed to by the Government based on the Contractor's architecture tools. The Contractor shall also maintain and deliver applicable CDRL items using the Contractor's architecture tools, as required by the Software Architecture Description (SAD), CDRL <A0xx>. The Contractor shall provide updated or archived artifacts <monthly>.

e) The Contractor shall warrant that all electronic data delivered in any form (i.e., magnetic storage media, optical storage media, or network file transfer) is free from all malicious software (e.g., viruses, Trojan horses, and worms).

11.2 Requirements management tools

Some SMC program offices currently prefer to specify a specific requirements management tool on most contracts. Many acquisition program offices are experienced with these tools and many of the contractors use them. If instead, the Government wants to let the Offeror propose a tool and the Government approves use of that tool, then neutral language allows that. This subsection uses the alternative term <Automated Commercial Requirements Management Product (ACRMP)> . Fill in each highlighted tool reference, e.g., <ACRMP>, with the program's preferred tool or use neutral language. The program office should also provide detailed requirements for the minimum attributes expected to be used within the requirements management tool. See Appendix B for an example of these attributes.

SMC -- H0xx REQUIREMENTS MANAGEMENT TOOL (MMM 20xx)

- The Contractor shall use the <Automated Commercial Requirements Management Product (ACRMP)> tool format as specified in the CDRL Exhibit to maintain and manage its <PROJECT ID> requirements documentation.
- At a minimum, the <ACRMP> tool shall be used to maintain and show bi-directional traceability of the <PROJECT ID> requirements from the Technical Requirements Document (TRD) to all of the requirements documents that will be generated from the TRD as required by the Contract DD Forms 1423 in the CDRL Exhibit.
- The Contractor shall also maintain and deliver applicable CDRL items using <ACRMP>, as specified by the Contract DD Forms 1423.
- The Contractor shall provide the CDRL items specified as <ACRMP> deliverables using the <ACRMP> and Microsoft Word attributes specified in the CDRL Exhibit for compatibility.
- The Contractor shall provide continuously available, secure, encrypted remote access such that any authorized individual can view the Contractor's <PROJECT ID> specified <ACRMP> database within 45 CD of contract award.
- The initial and any subsequent <ACRMP> versions to be used by the Contractor for <PROJECT ID> shall be coordinated with the Government.
- The contractor shall provide archive copies of the <ACRMP> database as specified in the CDRL Exhibit and as requested by the Government.

12. References

12.1 References

[Metrics] Abelson, L. A., R. J. Adams, and S. Eslinger, "*Metrics-Based Software Acquisition Management,*" Aerospace Report No. TOR-2004(3909)-3405, May 2004.

[Framework] Adams, R. J., S. Eslinger, "*A Framework for Software Products Within a System Context (2nd Edition),*" Aerospace Report No. TR-2002(8550)-3, 31 May 2002. Provides the system, segment, subsystem, element context for the software CDRL items and the RFP.

[SWBestPrac] Adams, R. J., S. Eslinger, K. L. Owens, and M. A. Rich, "*Software Acquisition Best Practices: Experiences from the Space Systems Domain,*" Technical Report No. TR-2004(8550)-1, September 2004.

[**SWBestPracEarly**] Adams, R.J., S. Eslinger, K. L. Owens, and M. A. Rich , "*Reducing Software Acquisition Risk: Best Practices for the Early Acquisition Phases,*" Aerospace Report No. TR-2006(8550)-1, 31 January 2006.

[SWDevStd] Adams, R. J., S. Eslinger, P. Hantos, K. L. Owens, L. T. Stephenson, J. M. Tagami, and R. Weiskopf, "*Software Development Standard for Space Systems Revision B,*" Aerospace Report No. TOR-2004(3909)-3537, 11 March 2005.

[SWStds] Adams, R. J., S. Eslinger, P. Hantos, K. L. Owens, L. T. Stephenson, and R. Weiskopf, "*Recommended Software Standards for Space Systems,*" Aerospace Report No. TOR 2004-(3909)-3406, 5 May 2004. Provides a list of recommended software standards.

[SE-CDRL] Bywater, R. J., D. A. Christopher, L. Gurevich, P. F. Humel, and V. I. Lang, "*Systems Engineering Contract Data Requirements Selection Guidelines for National Security Space Programs,*" Aerospace Report No. TOR-2004(8583)-3227, 20 April 2004.

[SAEBestPrc] Eslinger, S., "*Software Acquisition and Software Engineering Best Practices,*" Aerospace Report No. TR-2000(8550)-1, November 1999.

[LifeCycles] Hantos, P, *"Evolutionary Acquisition and Spiral Development Tutorial: Revision C"*, TOR-2006(8550)-6991, 31 July 2007.

[**SESpecsStds**] Shaw, B. E., J. Meltzer, *"SMC Compliance Specifications and Standards"*, TOR-2007(8583)-6475, 30 March 2007. See the Mission Assurance Portal for the latest version.

[STD 2167A] DOD-STD-2167A, *"Military Standard Defense System Software Development,"* 29 February, 1988.

[ISO 15939] ISO/IEC 15939:2002, *"Software Engineering – Software Measurement Process"*, 11 July 2002.

[MSO C-145] *"Military Standard Order: MSO-C145, Airborne Navigation Sensors Using The Global Positioning System (GPS) / Precise Positioning Service (PPS) For Area Navigation (RNAV) in Required Navigation Performance (RNP) Airspace; RNP-20 RNAV Through RNP-0.3 RNAV"*, 10 April 2003.

[STD-498] MIL-STD-498, *"Military Standard Software Development and Documentation,"* 05 December 1994.

[STD-785] MIL-STD-785, *"Military Standard Reliability Program for Systems and Equipment," MIL-STD-785B* (for ground systems), 5 August 1988.

[STD-1543] MIL-STD-1543, *"Military Standard Reliability Program for Space and Launch Vehicles," MIL-STD-1543* (for space systems), 25 October 1988.

[NSS 03-01] *National Security Space Acquisition Policy 03-01,* 27 December 2004.

[JA 1000] Society of Automotive Engineers (SAE), *"Reliability Program Standard", SAE JA 1000*, June, 1998.

[JA 1002] Society of Automotive Engineers (SAE), *"Software Reliability Program Standard", SAE JA 1002*, January 2004.

[JA 1003] Society of Automotive Engineers (SAE), *"Software Reliability Program Implementation Guide", SAE JA 1003,* January 2004.

[ARP 4754] Society of Automotive Engineers (SAE), SAE ARP 4754, *"Certification Considerations for Highly-Integrated or Complex Aircraft Systems"*, April 10, 1996.

[SMCI 63-104] *"Space and Missile Systems Center Instruction 63-104, Software Acquisition Instruction"*, 28 June 2006.

12.2 Governing Documents

The following references provide direction and guidance for the CDRL items.

[SWDevStd] Adams, R. J., S. Eslinger, P. Hantos, K. L. Owens, L. T. Stephenson, J. M. Tagami, and R. Weiskopf, "*Software Development Standard for Space Systems Revision B,*" Aerospace Report No. TOR-2004(3909)-3537, 11 March 2005.

[5000.04-M-1] DoD 5000.04-M-1, "Cost and Software Data Reporting (CSDR) Manual", 18 April 2007.
This Manual reissues DoD 5000.4-M-1 (Reference (a)) pursuant to the authority of DoD Directive 5000.04 (Reference (b)) and DoD Instruction 5000.2 (Reference (c)).

[5000.4-M] DoD 5000.4-M, "Cost Analysis Guidance and Procedures," 11December 1992.

[5000.04] DoDD 5000.04, "Cost Analysis Improvement Group (CAIG)," 16 August 2006.

[5000.2] DoDI 5000.2, "Operation of the Defense Acquisition System," 12 May, 2003.

[5010.12-M] DoD 5010.12-M, "Procedures for the Acquisition and Management of Technical Data", May 1993.

[63-104] SMCI 63-104, *"Space and Missile Systems Center Instruction 63-104, Software Acquisition Instruction"*, 28 June 2006.

[USAF Revit] Under Secretary of the Air Force, Memorandum: "Revitalizing Software Aspects of Systems Engineering," 20 September 2004.
This memorandum lists the minimum set of required software metrics.

13. Resources

Links provided below were current at publication time, but may change.

- Specifications, Standards, and Data Item Descriptions (DIDs)

Military specifications, standards, and data item descriptions (DIDs) can usually be found at the Acquisition Streamlining and Standardization Information System (ASSIST) web site:

http://assist.daps.dla.mil/quicksearch/

Follow the "Quick Search" link. No account and password are needed for “Quick Search".

- CDRL Item Forms

The Government at SMC previously used the AF Form 585, Contractor Data Requirement Substantiation, for providing the justification of each CDRL item. There is a newer form that supersedes AF Form 585. Visit the Secretary of the Air Force Acquisition web site at:

https://www.safaq.hq.af.mil/contracting/affars/5342/library-5342.html

and look for "Contract Data Requirements Substantiation - Template" [SAF/AQCP, Feb 05] to find the new justification form.

To find the form for one Contract Data Requirements List item visit the Defense Technical Information Center, Washington Headquarters Services web site.

http://www.dtic.mil/whs/directives/
and select DoD Forms

A fillable PDF version of the DD Form 1423-1 for one Contract Data Requirements List item is at:

http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1423-1.pdf

Links to forms are at:

http://www.dtic.mil/whs/directives/infomgt/forms/formsprogram.htm

- SRDR Forms and Instructions

For more information on the Software Resources Data Reporting (SRDR) and its forms see the Defense Cost and Resource Center (DCARC) web site and manuals at:

http://dcarc.pae.osd.mil/Policy/srdr/index.aspx and
http://dcarc.pae.osd.mil/Policy/CSDR/csdrReporting.aspx
http://dcarc.pae.osd.mil/Policy/csdr/csdrPolicy.aspx

This information is parallel to National Security Space Acquisition Policy Number 03-01, paragraph AP3.4, Data Collection.

- AF Publishing – e-publishing

http://www.e-publishing.af.mil

- The Aerospace Corporation Customer and Employee Resources

  Table 13-1 show the departments and their specialties. The Aerospace Corporation can provide customers and employees with CDRL item expertise in the following areas. Other organizations have similar expertise to support their programs.

Table 13-1: CDRL Item Expertise Within The Aerospace Corporation

Area of Expertise	Department
Aviation Safety	Software Acquisition and Process Department
Financial	Cost and Requirements Department Software Acquisition and Process Department
Human Systems Integration	System Delivery and Operations Department
Information Assurance	Information Assurance Technology Department
Reliability, Maintainability, and Availability	Software Acquisition and Process Department
Request for Proposal Training	Program Executability Directorate
Software Acquisition (including Software CDRL items)	Software Acquisition and Process Department
Software and Systems Processes	Software Acquisition and Process Department
Software Architecture and Design	Software Architecture Engineering Department
Software Assurance	Software Assurance Department
Software Estimation	Cost and Requirements Department Software Acquisition and Process Department
Software Safety	Software Acquisition and Process Department
Software Standards	Software Acquisition and Process Department
Software Testing	Software Acquisition and Process Department Software Assurance Department
Systems Engineering	Acquisition and Risk Management Office Systems Delivery and Operations Department Systems Engineering and Software Directorate

- Space and Missile Systems Center (SMC) Resources

  Table 13-2 shows the organizations and their specialties. SMC can provide CDRL item expertise in the following areas. Other organizations have similar expertise to support their programs.

Table 13-2: CDRL Item Expertise Within SMC

Area of Expertise	Organization
Acquisition	SMC/PI Acquisition Center of Excellence (ACE)
Specifications and Standards	SMC/EA Specifications and Standards Working Group Engineering Acquisition Support Team (EAST)

14. Acronyms and Abbreviations

ACRMP	Automated Commercial Requirements Management Product
ADR	Anomaly Detection and Recovery
AF	Air Force
AFHA	Aviation Functional Hazard Analysis
AFOTEC	Air Force Operational Test and Evaluation Center
AFSCF	Air Force Satellite Control Facility
AOSA	Aviation Operational Safety Analysis
APSSA	Aviation Preliminary System Safety Analysis
ARP	Aerospace Recommended Practice
ASAP	Aviation Safety Assurance Plan
ASAS	Aviation Software Accomplishment Summary
ASSA	Aviation System Safety Analysis
ASSIST	Acquisition Streamlining and Standardization Information System
ATP	Authority To Proceed
CAIG	Cost Analysis Improvement Group
CARD	Cost Analysis Requirements Document
CD	Calendar Days
CDA	Contractual Document Action
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CMMI®	Capability Maturity Model℠ Integration®
CMP	Configuration Management Plan
COM	Computer Operation Manual
CONOPS	Concept of Operations
CPM	Computer Programming Manual
CRISD	Computer Resources Integrated Support Document
CSCI	Computer Software Configuration Item
CSDR	Cost and Software Data Reporting
CSOM	Computer System Operator's Manual
CSOW	Contractor Statement of Work
DAL	Data Accession List
DBDD	Database Design Description
DBMS	Database Management System
DCARC	Defense Cost and Resource Center
DID	Data Item Description
DM	Data Management
DoD	Department of Defense (preferred by Department of Defense)
DOD	Department of Defense (used in some references such as DOD-STD-XXX)
DOORS	Dynamic Object Oriented Requirements System
DRRB	Data Requirements Review Board
EDI	Electronic Data Interchange

EDIN	Electronic Data Interchange Network
ES	Element Specification
EVR	Earned Value Reports
FFRDC	Federally Funded Research and Development Center
FMEA/CA	Failure Modes and Effects Analyses and Criticality Analyses
FRACAS	Failure Reporting and Corrective Action System
FSDA	Fail Safe Design Analysis
FSM	Firmware Support Manual
FTFD	Field Test Force Director
GPS	Global Positioning System
HEDAD-M	Human Engineering Design Approach Document - Maintenance
HEDAD-O	Human Engineering Design Approach Document - Operator
HEPP	Human Engineering Program Plan
HESAR	Human Engineering System Analysis Report
HETP	Human Engineering Test Plan
HETR	Human Engineering Test Report
HI	Hardware Item
HSI	Human Systems Integration
HW	Hardware
KDP	Key Decision Point
KMP	Key Management Plan
IA	Information Assurance
IAW	In accordance with
ICD	Interface Control Document
IDD	Interface Design Description
IMP	Integrated Master Plan
IMS	Integrated Master Schedule
IPA	Independent Program Assessment
IRS	Interface Requirements Specification
IRS-E	Interface Requirements Specification – External
IRS-I	Interface Requirements Specification – Internal
ITP	Integration and Test Plan
KMP	Key Management Plan
MIL-STD	Military Standard
MSO-C145	Military Standard Order: MSO-C145, Airborne Navigation Sensors Using The Global Positioning System (GPS) / Precise Positioning Service (PPS) For Area Navigation (RNAV) in Required Navigation Performance (RNP) Airspace; RNP-20 RNAV Through RNP-0.3 RNAV
MSIVP	Master Software Integration and Verification Plan
NDI	Non-development Item
NLT	No later than
NSA	National Security Agency
NSS	National Security Space
OCD	Operational Concept Description
OOH	Orbital Operations Handbook
OPR	Office of Primary Responsibility

PCA	Physical Configuration Audit
PCO	Procuring Contracting Officer
PDR	Preliminary Design Review
PFR	Problem Failure Report
PHAC	Plan for Hardware Aspects of Certification
POC	Point of Contact
PPIP	Program Protection Implementation Plan
PPS	Precise Positioning Service
PSAC	Plan for Software Aspects of Certification
QAMP	Quality Assurance Management Plan
QT	Qualification Testing
RFP	Request For Proposal
RAAAR	Reliability Allocations, Assessment, and Analysis Report
RMA	Reliability, Maintainability, and Availability
RMAP	Reliability Modeling and Prediction
RNAV	Area Navigation
RNP	Required Navigation Performance
RPP	Reliability Program Plan
RTPP	Reliability Test Plans and Reports
SAD	Software Architecture Description
SAE	Society of Automotive Engineers
SAPD	Software Acquisition and Process Department
SCI	Software Configuration Identification
SCOM	Software Center Operator Manual
SDD	Software Design Description
SDF	Software Development Files
SDP	Software Development Plan
SDR	System Design Review
SEMP	Systems Engineering Management Plan
SETA	System Engineering and Technical Assistance
SFUG	Security Features User Guide
SI	Software Item
SIOM	Software Input/Output Manual
SIP	Software Installation Plan
SMBP	Software Master Build Plan
SMC	Space and Missile Systems Center
SMR	Software Measurement Report
SOO	Statement of Objectives
SOW	Statement of Work
SPA	Security Production Assurance
SPM	Software Programmer's Manual
SPO	System Program Office or Acquisition Program Office
SPS	Software Product Specification
SRC	Software Reliability Case
SRDR	Software Resources Data Reporting: Initial and Final Developer Report and Data Dictionary or Software Resources Data Report

SRP	Software Reliability Plan
SRR	System Requirements Review
SRS	Software Requirements Specification
SSDD	System/Segment Design Description
SSIVP	System/Segment Integration and Verification Plan
SSMR	Software and System Measurement Report
SSPP	System Safety Program Plan
SSS	System/Segment Specification
SSTD	System/Segment Test Description
SSTP	System/Segment Test Plan
SSTR	System/Segment Test Report
STD	Software Test Description
STP	Software Test Plan
STR	Software Test Report
STrP	Software Transition Plan
SUM	Software User's Manual
SVD	Software Version Description
SVP	Security Verification Plan
SW	Software
SW-CMM®	Capability Maturity Model® for Software
TCT	Test Control Team
TDO	Theory of Design & Operation
TEPP	Test and Evaluation Program Plan
TFM	Trusted Facility Manual
TIR	Test Inspection Report
TOC	Theory of Compliance
TOR	Technical Operating Report
TPln	Test Plan
TPrc	Test Procedures
TRD	Technical Requirements Document
TrP	Transition Plan
TSO C-145	Technical Standard Order (TSO) C-145, "Airborne Navigation Sensors using the Global Positioning System (GPS) augmented by the Wide Area Augmentation System (WAAS)"
TSPR	Total System Performance Responsibility
VDD	Version Description Document
VPN	Virtual Private Network
WBS	Work Breakdown Structure

Appendix A. Software-related CDRL Items

Table A-1 lists the CDRL items that are provided in "*Systems Engineering Contract Data Requirements Selection Guidelines for National Security Space Programs*," Aerospace Report No. TOR-2004(8583)-3227 **[SE-CDRL]** as well as the CDRL item 1423s provided in this CDRL TOR.

Table A-1: Systems Engineering and Software CDRL Items

Contract Data Requirements List Item	Contract Level	Software Level	In this TOR	In TOR-2004(8583)-3227
Plans				
Configuration Management Plan (CMP)	X			X
Contract Work Breakdown Structure (CWBS)	X			X
Data Accession List (DAL)	X			X
Design Review Package	X			X
Engineering Change Proposal	X			X
Integration and Test Plan (ITP)	X			X
Integrated Master Schedule (IMS)	X			X
Software Master Build Plan (SMBP)		X	X	
Risk Management Plan	X			X
Software Development Plan (SDP)	X		X	X
Software Transition Plan (STrP)		X	X	
System Safety Program Plan (SSPP)	X			X
Systems Engineering Management Plan (SEMP)	X			X
System/Segment Integration and Verification Plan (SSIVP)	X			Verification Plan
System/Segment Interface Control Specification	X			X
Transition Plan (TrP)	X			
Reports				
Earned Value Reports (EVR)	X			X
Failure Summary and Analysis	X			X
Software [and Systems] Metrics Report (SMR) (SSMR)		X	X	
Software Resources Data Report (SRDR)		X	X	
Requirements				
Interface Requirements Specification - External (IRS-E)	X		X	
Interface Requirements Specification - Internal (IRS-I)	X	X	X	
Software Requirements Specification (SRS)		X	X	
System/Segment Specification (SSS)	X			X
Tailored Specification or Standard	X			X
Design				
Database Design Description (DBDD)		X		
Operational Concept Description (OCD)	X			
Software Architecture Description (SAD)		X	X	
System/Segment Design Description (SSDD)	X			
Test and Verification				
Software Test Description (STD)		X	X	
Software Test Plan (STP)		X	X	
Software Test Report (STR)		X	X	
System/Segment Test Plan (SSTP)	X			TP
System/Segment Test Description (SSTD)	X			
System/Segment Test Report (SSTR)	X			TIR
Delivery, Installation and Maintenance				
Logistics Management Information				X
Orbital Operations Handbook (OOH)	X			
Software Product Specification (SPS)		X	X	
Software Version Description (SVD)		X	X	
Operations				
Software User Manual (SUM)		X	X	

Appendix B. Example Requirements Management Tool Instructions

ATTACHMENT <nnn>

REQUIREMENTS MANAGEMENT TOOL INSTRUCTIONS

Dynamic Object-Oriented Requirements System (DOORS)[1] Instructions:

The contractor shall provide CDRL(s) specified in Table 2 as a DOORS archive module. If the DOORS file contains links to other modules, then the archive file shall be a DOORS project archive (.dpa) file. If there are no links, then the archive shall be a DOORS module archive (.dma) file.

All DOORS module archives shall use the following naming convention: COMPANYNAME_CDRL NUMBER_PROJECT NAME_ARCHIVEDATE.dma.

All DOORS project archives shall use the following naming convention: COMPANYNAME_CDRL NUMBER_PROJECT NAME_ARCHIVEDATE.dpa. The contractor shall coordinate with the JPO to deliver a project archive that contains the appropriate link schematic. The project archive shall correctly employ the use of link modules and linksets.

The contractor shall submit Microsoft Word files using the following specified DOORS compatible format:

a. For MS WORD submittals the following format applies:

All headers shall be styled as Heading 1, Heading 2, etc. For example:
2 FUNCTIONAL REQUIREMENTS (Heading 1)
2.1 Power (Heading 2)
2.1.1 Battery (Heading 3)
The battery shall be rechargeable (Normal)

b. All requirements shall be written in a form of single sentence. If there are multiple sentences in the paragraph, those will be the supported statements which do not include the word “shall”.

c. All headings shall be separated from the text using paragraph returns. Text paragraphs shall be styled as Normal and end with a paragraph return. There shall be no blank lines with paragraph returns. Each Paragraph shall contain a single requirement.

d. Figures need to be embedded as OLE objects. The contractor shall ensure that there are no additional layered figures. In instance where a user will utilize Word’s draw features to highlight portions of a diagram using arrows and text boxes, when exported to DOORS, these layered figures will come over as separate objects, and the original picture will be fragmented. The contractor shall change these layered figures into a single figure contained within an Object Link/Embed (OLE) object.

e. Title and signature page shall be extracted into a separate WORD file and then reinserted into the document file, at the same location, as an Object Link/Embed (OLE) object.

[1] This is an example of a requirements management tool using DOORS, with typical attributes. This document does not advocate using a specific tool.

f. Tables without embedded requirements shall be extracted into separate word files and then reinserted into the document file, at the same location, as Object Link/Embed (OLE) objects.

g. Tables with embedded requirements shall not contain merged cells. The contractor shall repair any tables containing merged cells and also manipulate the tables' borders such that it does not contain any merged cells. When these tables are brought into DOORS, they will be automatically parsed into the database module as DOORS tables. Each cell will have the capability to be separately linked to other documents when parsed in as DOORS tables.

h. The government requires the minimum number of attributes (additional defined characteristics) of Table 1 be applied to all specifications and ICD's. The contractor shall supply these specified attributes. If a WORD file is submitted, then the attributes shall be submitted along with the main body WORD file as an Excel Spreadsheet file showing each paragraph DOORS object ID and the corresponding attributes. Other attributes may optionally be added at the contractor's discretion.

i. DOORS baseline versions of a DOORS module shall be coordinated with the JPO prior to incorporation. The contractor shall baseline the last JPO approved versions into a DOORS baseline set and should include these baselines in their DOORS archive.

Submitting Changes

Submittals for CCB approval that document changes made to a file submitted to the <Program Office> as a DOORS file shall include a WORD formatted export from the DOORS file that include the following: Object Identifier, Object Number, Classification Level, Object Text headings, Object Text, Req. ID, Proposed Requirement, Reason For Change, and Verification Method. The WORD document will be submitted and approved by the CCB.

a. When submitting proposed changes, the contractor shall use the Proposed Requirement attribute for proposed wording changes and the Reason for Change attribute to describe the justification for a given object change.

b. When incorporating an approved change, the contractor shall place the new approved wording in the current object, the justification for a given object change in the Reason for Change attribute, and then populate the Authority attribute with the appropriate ECP number.

Table B-1: DOORS Attributes

DOORS ATTRIBUTES	BASE TYPE	ENUMERATIONS	COMMENTS	MULTI-VALUE
Authority	Text		ECPs, IRNs, Deviations, Waivers, etc.	
Classification Level	Enumeration	Secret, Top Secret, Confidential, FOUO, Limited Access, SAP, Unclassified	Classified data will reside in a separate database so only need to set to Unclassified or FOUO.	
Comments	Text		any comments	
Verification Method	Enumeration	Analysis, Test, Demonstration, Inspection, Special, Not Required		Multi
Proposed Requirement	Text		Proposed new object wording.	
Reason For Change	Text		Describes the justification for a given object change.	

Table B-2: Optional DOORS Attributes

DOORS ATTRIBUTES	BASE TYPE	ENUMERATIONS	COMMENTS	MULTI-VALUE
Rationale	Text		Brief description of origin of the requirement, with references as appropriate	

Table B-3: DOORS Format CDRL Items

CDRL NO.	DATA ITEM TITLE	SUBTITLE
A0xx	Test Requirements Document	Unit Level
A0xx	Interface Control Document (ICD)	N/R
A0xx	Configuration Item Development Specification	Space Vehicle Prime Item and Lower Tier Critical Item Development Specifications
A0xx	Configuration Item Product Fabrication Specification	Space Vehicle C1B, Prime Item PT II and C1 and C2 Product Specifications
A0xx	System/Segment Specification (SSS)	N/R
A0xx	Software Requirements Specification (SRS)	N/R
A0xx	Interface Requirements Specification (IRS)	N/R
A0xx	Software Test Plan (STP)	N/R
A0xx	Software Test Description (STD)	N/R
A0xx	Software Test Report (STR)	N/R
A0xx	Technical Report Study/Services	SV Requirements Verification Plan And Matrix
A0xx	Test Procedure	N/R
A0xx	Test Plans/Procedures	Satellite Plan
Axxx	Technical Operating Report	Requirements Traceability Matrix
Axxx	Program Requirements Document	N/R
Axxx	Acceptance Test Report	Space Vehicle Data Package

Appendix C. DD Form 1423-1 Instructions

The instructions for the DD Form 1423-1 form are on the next page.

INSTRUCTIONS FOR COMPLETING DD FORM 1423

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

Item A. Self-explanatory.

Item B. Self-explanatory.

Item C. Mark (X) appropriate category: TDP -Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning," "Configuration Management," etc.

Item D. Enter name of system/Item being acquired that data will support.

Item E. Self-explanatory (to be filled in after contract award).

Item F. Self-explanatory (to be filled in after contract award).

Item G. Signature of preparer of CDRL.

Item H. Date CDRL was prepared.

Item I. Signature of CDRL approval authority.

Item J. Date CDRL was approved.

Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.

Item 2. Enter title as it appears on data acquisition document cited in Item 4.

Item 3. Enter subtitle of data item for further definition of data Item (optional entry).

Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.

Item 5. Enter reference to tasking in contract that generates requirement for the data Item (e.g., Statement of Work paragraph number).

Item 6. Enter technical office responsible for ensuring adequacy of the data item.

Item 7. Specify requirement for inspection/acceptance of the data item by the Government.

Item 8. Specify requirement for approval of a draft before preparation of the final data item.

Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).

Item 10. Specify number of times data items are to be delivered.

Item 11. Specify as-of date of data item, when applicable.

Item 12. Specify when first submittal is required.

Item 13. Specify when subsequent submittals are required, when applicable.

Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 16.

Item 15. Enter total number of draft/final copies to be delivered.

Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in Item 4; Clarification of submittal dates in Items 12 and 13; Explanation of reproducible copies in Item 14.; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data Item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price -Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights in data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

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