

System / Subsystem Specification
for the
Broadcast Dissemination Platform
Family of Systems

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DOCUMENT CHANGE HISTORY

The following table is a simple list of released revisions sent for review. Records of reviews and the review artifacts are saved with reviewer information in the The KNEAD Project artifact repository.

Change Record

Date	Version	Author(s)	Change Reference
01 Feb 2021	P1	Lewis Collier and Brady Spatola	Preliminary DRAFT version
25 Mar 2022	P2	Lewis Collier, Chris Doerge, and Brady Spatola	Numerous additions made throughout the document
14 Apr 2022	P3	Lewis Collier, Chris Doerge, and Brady Spatola	Changes made throughout the document

Each subsequent “section” outlines changes in each release.

Items in this version that are marked with change bars have been modified from the most recent previous version (e.g. P3 changes from P2) or are new as of the current revision. A list of all changed items may be found in the Index section under the heading “All Changes This Version”.

Draft P1 Preliminary version of this document.

Draft P2 Second draft version of this document with a number additions from P1.

Draft P3 Third draft version of this document with a number changes and additions from P2.

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CHAPTER 1

Scope

SSS-1.0.0 :: IF APPLICABLE, EACH SECTION HAS A SUMMARY OF DATA ITEM DESCRIPTION (DID) INFORMATION SHOWN IN THIS FONT. SEE REFERENCE [ref'SSS'DID] FOR MORE INFORMATION. THESE ARE DISPLAYED IN SMALL CAPITAL FONT AND ARE NOT PART OF THE FORMAL SPECIFICATIONS. DISPLAY OF THESE DID INFORMATION NOTES CAN BE TURNED OFF FOR FORMAL RELEASES, BUT ARE DISPLAYED HERE FOR REFERENCE.

This document provides the System / Subsystem Specification (SSS) for the Smart Silvia. The system will be referred to as the Smart-Silvia-Sys.

1.1 Identification

SSS-1.1.0 :: THIS PARAGRAPH SHALL CONTAIN A FULL IDENTIFICATION OF THE SYSTEM TO WHICH THIS DOCUMENT APPLIES, INCLUDING, AS APPLICABLE, IDENTIFICATION NUMBER(S), TITLE(S), ABBREVIATION(S), VERSION NUMBER(S), AND RELEASE NUMBER(S).

The Smart Silvia described in this document shall be known as Smart-Silvia-Sys version 1. However, the System / Subsystem Specification SSS described herein shall be applicable to pre-releases such as Beta-releases for a phased release as listed for each requirement. The major system interfaces and capabilities are fully specified in Chapter 3.

1.2 System Overview


SSS-1.2.0 :: THIS PARAGRAPH SHALL BRIEFLY STATE THE PURPOSE OF THE SYSTEM TO WHICH THIS DOCUMENT APPLIES. IT SHALL DESCRIBE THE GENERAL NATURE OF THE SYSTEM; SUMMARIZE THE HISTORY OF SYSTEM DEVELOPMENT, OPERATION, AND MAINTENANCE; IDENTIFY THE PROJECT SPONSOR, ACQUIRER, USER, DEVELOPER, AND SUPPORT AGENCIES; IDENTIFY CURRENT AND PLANNED OPERATING SITES; AND LIST OTHER RELEVANT DOCUMENTS.

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The Smart Silvia system is ...TBD....

Figure ?? shows the high-level architecture for the Smart-Silvia-Sys system. This diagram shows the major external interfaces that provide the capabilities of Smart-Silvia-Sys. As are shown, the Smart-Silvia-Sys can provide. This system's main goal is to automate functionality in order to make great Espresso.

The general concept of operations (CONOP) for this system is User Selects an input weight through an OLED screen using a rotary encoder. Espresso is prepared. User begins a shot, solid state relays are enabled and the shot begins to pull and a timer is started. As water falls into the cup and onto the load cells, the espresso cup is weighed. Once the desired



Kneadable	Kneadable
Nimble	Nimble
Engineering	Engineering
Artifact	Artifact
Design	Design

Figure 1: System Overview

weight is met the pump is turned off. The user is displayed their time and weight on the OLED screen and data is pushed ...TBD...

While the system is not actively pulling a shot, it will be monitoring the water level. If low water is detected the user will be notified.

1.3 Document Overview

SSS-1.3.0 :: THIS PARAGRAPH SHALL SUMMARIZE THE PURPOSE AND CONTENTS OF THIS DOCUMENT AND SHALL DESCRIBE ANY SECURITY OR PRIVACY CONSIDERATIONS ASSOCIATED WITH ITS USE.

This section provides information about the format of this document. Some information provides general details about the format of this specification document. This information, such as formatting details, is common across all levels of specification documents. Other information is specific to this particular document. This information is provided to assist the reader in understanding the format and layout of the information contained in this document.

1.3.1 Document Sections

This document content is based upon the guidance in the TRD template from MIL-HDBK-520A (2010) [ref`MIL`HDBK`520]. The specifications and associated acceptance criteria are documented following the guidelines of ISO-12207 [ref`ISO`12207] and MIL-STD-498 [ref`MIL`STD`498], from which ISO-12207 originated.

The document name follows from the DID DI-IPSC-81431A [ref`SSS`DID] naming convention where the content level of the document is used in the name. Since this document includes both the system and subsystem specifications, the name System / Subsystem Specification is used to convey the complete scope of coverage of this system engineering life cycle artifact. Depending upon the target audience, the nomenclature of Technical Requirements Document (TRD) may also be used as the title.

Regardless of the title, the detailed document formatting follows the SSS DID [ref`SSS`DID], with a few minor tailoring changes intended to aid the readability of the content when traversing the document from front to back, with minimal disruption to the “well-known” locations of material. Following the overall MIL-STD-498 [ref`MIL`STD`498] documentation schema of providing material before it is needed, these changes allow for information to be found either before it is needed, or in conjunction with the associated information. The following paragraphs detail the formatting changes provided for enhanced readability and, hopefully, for increased comprehension, to further ensure that this document clearly represents the desired specifications for the system.

The first format tailoring change allows for the system interfaces to be specified before the system capabilities. This follows standard structured design practice, e.g. Yourdon’s Structured Method [ref`JESA], whereby the system context is provided before the design itself. The net result of this change is that system capabilities are presented in section 3.3

and external system interfaces are described in section 3.2, instead of in sections 3.2 and 3.3, respectively, as listed in the SSS template. This minor reordering allows the data inputs to, and outputs from, the system to be defined *before* they are used in, or generated from, the overall system capabilities, much as functional programming requires inputs and outputs to be defined before use within the body of the function.

The second format tailoring change relates to placement of general material within the document. The qualification provisions and traceability details, if applicable, are listed with each requirement. This formatting option, which is listed in the SSS DID [ref'SSS'DID], allows the reader to view all relevant information for each requirement in a single location, rather than requiring constant page turning. This information may be duplicated in Sections 4 and 5, respectively, and if done this way, it can be generated automatically to prevent manual duplication errors. In addition, the key performance parameters (KPP's), the key system attributes (KSA's), and in fact, all specifications, can be listed separately, without the additional information, in an appendix, should this representation be desired. If any specifications are denoted by the author as either a KPP or a KSA, then these will be listed in Appendix B, which is colloquially known as a "B-Spec".

The final format tailoring change involves the placement of the table of acronyms and glossary terms. Instead of residing in Chapter 6, "Notes", these reading reference items are also provided in Chapter 2, with the bibliography references. This change, also made for readability of the document, allows these reference items to be parsed by readers before encountering most of the acronyms and glossary terms.

Otherwise, this document follows the listed SSS sub-section order.

Section 1 provides an overview of the system and this document.

Section 2 lists general and application-specific reference documents as well as glossary terms and acronyms.

Section 3 details the specifications for the system.

Section 4 maps the specifications to quality provisions.

Section 5 traces specifications to the original source.

Section 6 if needed, lists any general notes as may be applicable beyond any notes provided in the requirement and expectation tables in section 3.

Appendices if needed, provide additional information as may be needed.

1.3.2 Specification Formatting

The specifications are listed and numbered by document sections. The fully qualified specification numbers include the sub-section in which it is contained. These specification numbers are tied to the document level thus they are numbered from 1 to N for each sub-section of the requirements section. This is done to allow for additions within a sub-system without affecting the numbering in other sub-systems. Once a specification has been added, it cannot be deleted, only its status may be changed to “inactive” or “deleted” to preserve numbering.

This document allows for marking changes to specifications. All specifications may be marked with a change bar. This generally implies that one or more parts of a specification changed from the prior revision. A note should be provided to indicate the reason for the change, and when, so that future versions of the document, which do not include the change bar, still have rationale included for the current value.

The system specifications are listed in a common table format as shown in Requirement ??.

Specification 1.3.1 Specification Table Format

Text	<ol style="list-style-type: none">1. The first row of a table provides a unique number and a title for the requirement or expectation. This row is generated from the first 3 arguments.2. The second row of the table provides the specification text of the requirement. Normally this is a single sentence with a single testable requirement (shall) statement. This example uses an enumerated list in order to describe all the rows in a single table.3. The next row of the table provides the status for the specification listed in the table. This includes the applicable phases or release versions in which the required feature is supported, where $S \in \{(T)hreshold, (O)bjective, (I)nactive, (D)eleted\}$.4. The next row of the table provides the acceptance criteria. This row follows the form of “This requirement shall be verified by $V \in \{inspection, demonstration, test, analysis\}$.” Additional information regarding testing can be provided in the notes section.5. The next row of the table provides the traceability of the requirement. The traceability connects the requirement to a higher level document that calls out the need for a requirement. The structure of traceability is expected to be of the form “This requirement traces to MIL-STD-498 [ref`MIL`STD`498] and ISO-12207 [ref`ISO`12207].” Note that the source is expected to be listed in the reference documents section.6. The final row of the table provides, if applicable, notes for the specification. Notes are not a formal part of the requirement or expectation but provide supporting information regarding the feature.
Status	All phases This format is active for all specifications in this document.
Acceptance	This specification is not a testable requirement for the system; it is for demonstration purposes only.
Traceability	N/A There is no traceability for this requirement.

P1

The status designations for each specification $S \in \{(T)hreshold, (O)bjective, (I)nactive, (D)eleted\}$ are based on the following criteria.

- (T) - **Threshold** Items marked “(T) - Threshold” are driven by the project threshold needs that must be met in the specified phase.
- (O) - **Objective** Items marked “(O) - Objective” are objective goals of the system in the specified phase. These requirements may stay (O) for all listed phases or may transition from (O) to (T) in future phases. This provides hints as to future expansion of system capabilities so the design can account for the feature without significant later rework.
- (I) - **Inactive** Items marked “(I) - Inactive” are requirements that are not currently to be met by the system in the specified phase. Unlike “(O) - Objective” requirements, (I)

requirements may be in limbo in terms of certain details but their inclusion may also provide hints as to future expansion of system capabilities.

- (D) - **Deleted** Requirements that are not to be met by the system are marked by “(D) - Deleted”. Use of this status, vice removal of the requirement text, preserves the numbering of subsequent requirements and notes that the requirement once was invoked. The rationale for the deletion should be included in the notes section.

External tools have been written that allow for automatic generation of other documentation. Specially, data for chapters and appendices that follow the requirement specifications, can be gleaned automatically to ensure integrity between the sections of the documents. In addition, the listing of KPP and KSA values into a “B-spec” can be automated. Finally, the full set of requirements, and the associated attributes, are exported to a comprehensive .CSV file for import into external tools such as DOORS™.

This table approach offers other advantages besides automated parsing for import into tools. As can be seen in Table ??, and in all the specifications, this format groups all information for each specification into a separable and easily viewed structure. The document sections and subsections provide a logical grouping of the specifications but the table allows all pertinent information to be grouped, vice being split across major sections of the document. This grouping allows for easier presentation since each grouping is similar to a “PowerPoint” presentation slide. And, as will be seen in Section ??, it can help the writer organize specifications. The approach also allows for a “List of Specifications” to be generated. Each table is listed in the list of specifications so that each high level grouping can be quickly located from the list. Of course, the tables are located in the appropriate sections as noted in Section ?? so they can be found in that manner as well.

Another major advantage of the table format is the “Notes” section. As specifications are developed, there will be many issues to be resolved. And, once issues are clarified, tracking the rationale for the decision is just as important as recording the answer [ref`Brooks`MMM]. Thus the notes section helps the reader and the writer. The writer has a logically grouped place to put notes for each specification and the reader can easily find them without having to refer to footnotes, separated sections, or external documentation.

1.3.3 How To Read Specifications

System Performance Specification (SPS) documents, by their very nature, are a collection of independent but interconnected facts. Systems require interfaces from which inputs are consumed and to which outputs are produced. These input data are transformed by the capabilities to produce the outputs. The entire system has myriad other requirements ranging from data formatting through physical limits on things like the enclosure and packaging.

Finally, at the system level, specifications need to dictate *what, and, how well* a system must perform. Likewise, in order to separate documentation functionality, the SPS should not state explicitly *how* the system is to be formed, except in very special circumstances. Given the disparate nature of the requirements, system performance specifications can be hard to digest.

System / sub-system Segmentation Specification (SSS) and Software Requirements Specification (SRS) documents suffer from many of the same issues as do SPS documents. An SSS turns the performance specification into a first level design. Where the SPS has disparate performance requirements, the SSS has disjoint hardware and software configuration items listed as well as a mapping of the two items on to, and in to, each other. For the requirement management function, each element of the system design in the SSS traces back to the overall SPS specifications. Only at the SRS level do the requirements start to focus on a single item. Thus, the SSS and SRS level documents describe share a common contextual issue with the SPS document.

An understanding of the documents' structures is needed to help parse the information. The developers of MIL-STD-498 [ref¹MIL'STD'498], however, understood this and devised a format that can help manage the information overload. The method by which this is accomplished is to organize requirements into eighteen specific groupings. By understanding these groupings, a reader can improve their understanding of the system described by the requirements by understanding that specific information is listed in specified sections.

These documents follow a *read-forward* mentality so that base information is provided before it is actually needed.¹ For example, the referenced documents (and in this document the list of acronyms and glossary terms) are provided in the second chapter, before most items are actually cited. By presenting this information to the reader before citation, the format allows the reader to glean upfront information about the kind of things that will be covered later on in the document. Presentation of the referenced material ahead of the document body also allows the reader to have a priori information before encountering the symbol in the text. By understanding these formatting clues, the reader is able to be prepared for what is coming further down the road in the document.

Another reason for this organization is that different readers process information differently. There is no one format that will be best for all readers. By having the information

¹In fact, the read-forward philosophy extends across the documents as well but that topic is beyond the scope of this discussion.

in standardized sections across all such performance specifications, however, readers can use the document as a reference as needed. As an example, Section 3.1 of these documents will always define the system states and modes. If a reader wants to look up this information, it is always in that section. And, since it is listed first, all ensuing sections can reference states and modes in order to qualify their requirements. Likewise, having external interfaces presented *before* the capabilities means that the capabilities can define the transformations without having to worry about how the data is ingested into the system; the data is already “in the system” from a reader’s point of view when the data is needed to define the transformation.

This separation between, and the presentation order of, the data and processing is important when the same data supports multiple capabilities. A hierarchical description of “derived” requirements often would have a capability definition leading to the requirements for the data needed by the capability. In the case, which occurs often, where the data is used in two different transformation capabilities, a hierarchical approach of capability leading to external interfaces is met with the problem of which capability gets to have the data interface in its tree. This approach also leads to the dilemma of what to do when that first capability is no longer needed by the system but the second capability, and thus the data defined under the first capability tree, still *is* needed by the system. Just as loosely coupled software is more maintainable, so are loosely coupled requirements.

A final note about reading actually comes from ideas about how to write a requirement document. The document format dictates a linear flow from start to finish. A reader often reads a document the first time from front to back; this is why the *read-forward* approach works.

The writer, however, is *not* constrained in the same linear manner. Thus, while writing requirements about a capability, the idea for a new state or mode may arise. The writer can easily jump to the states and modes section in order to add in the information and then return to complete the capability that led to the new state or mode, safe in his knowledge that when the reader sees this new specification, they should have already seen the newly defined state or mode that is used to qualify the requirement since the state or mode was already presented in an earlier section.

Readers can use this information to enjoy the fact that the writer jumped around in the writing phase to save the reader the same effort when trying to read the document. By understanding the sections and the expected contents of the sections, which are defined in

the SSS DID [ref`SSS`DID] and the related MIL-STD-498 [ref`MIL`STD`498] document templates, a reader can read cover-to-cover, or jump to the needed information quickly, knowing that the writer put the information in the specified sections to make finding the information easier for the reader.

1.3.4 Specification Traceability

A project typically has several levels of statements of what needs to be done. Often an Operational Concept Description (OCD) is developed to provide a high level description of the system to be developed and its expected uses. A set of documents that follows the MIL-STD-498 [ref`MIL`STD`498] DID formats is often developed for a project. A Statement of Work (SOW) or a Statement of Objectives (SOO) is often developed to direct contractors on a project. While a SOW or SOO is supposed to be more contractual statements of tasks and objectives rather than actually trying to specify what needs to be built, these documents often, however, do include system requirements. A better method is to have the SOW or SOO reference a formal SPS so that the full scope of the system can be defined. Situations for every project differ so the main thing to understand is that there will be many documents and that their contents need to be related to each other.

Given the number of specifications for a system, and all the levels at which the specifications may be written, understanding if all needs of a system are being met is critical. Different documents have different levels of specifications and design materials. A mapping between the specifications at all of the different levels is essential to make sure that the design meets all of the stated needs of the system and that the system does not include capabilities that are not required.

As a system performance specification, the SPS is the highest level of specification of systems requirements. This document defines *what* the system needs to do without saying *how*. Thus, in general, there should be nothing higher to which the requirements in a SPS can be traced. In practice, however, some document such as an OCD for the system, informal customer requirements documents, or a SOW or SOO for the project may be provided that indicates some of the system needs. If the specifications in the SPS meet all the use cases in the OCD then the system meets the needs but only if the use cases are all inclusive. Likewise, if the SOW or SOO tries to list things the system needs to do, these needs must be tracked. And, of course, statements of need in any straw-man requirements documents need to be met. Once the fully developed SPS specifications are captured then the higher level document(s) be examined to make sure that, at a minimum, all of those things listed

are captured in the SPS. This process ensures that the SPS is compliant with the other “defining” stakeholder documents.

To ensure coverage compliance, each of the higher level needs, whether implied or explicitly stated, needs to be mapped to the SPS specification(s) that cover each given need. This is expected to result in a one-to-many relationship where many of the SPS specifications are mapped to a single upper level need. And, each specification in the SPS can be mapped to multiple needs depending on the independence of the needs. The details of how to do this mapping, which is best handled through some relational database tool (e.g. DOORS™), are beyond the scope of this introduction. The important thing to note is that this traceability determines if the SPS covers the known needs of the system. Since a well-formed SPS includes many more facets than an OCD or SOW/ SOO, there may be orphan SPS requirements that do not map directly to the higher level documents. However, there can be no orphan needs from the stakeholder documents that do not map to the SPS. The key here is to perform a mapping between the SPS and any higher level stakeholder documents to ensure that the specifications of the SPS provide compliance to the higher document(s).

Another way of saying this is to summarize the overall design philosophy as follows: a level of design should be carried out and mapped to higher level artifacts rather than simply “deriving” requirements from the higher level documents. This mapping process, thus, is *not* a way to derive a fully defining set of requirements for the SPS. The act of “deriving” specifications of system from a non-specification document such as a OCD, SOW, or SOO does *not* ensure that all the true system needs are captured. In fact if this approach is followed then often many requirements are missed because of the incomplete nature of the OCD, SOW, or SOO list of system needs.

An SPS, just like any level document, needs to be developed using domain knowledge and by following best practices and a well-defined documentation format. All of the things that must be considered for defining a successful system need to be included in the SPS. Note that, obviously, if the SOW did all of this then the SOW would be the SPS. But, in practice, this rarely ever happens, nor should it. The SOW or SOO are programmatic level documents that list things to do to build the system; they are not supposed to define the system. This is the job of the SPS.

The system / sub-system segmentation specification (SSS) is the second level of specification of systems requirements. The SSS starts to define *how* the system will meet the needs and should include a top-level system decomposition (or segmentation) of capabilities from

the SPS to the sub-systems of the system. In a typical documentation set, there should be a higher-level document (i.e. the SPS) to which the specifications in the SSS can be traced. The goal here is to ensure compliance with the higher level document much as was done with the SPS and higher level programmatic documents. If the design specifications in the SSS cover all the performance specifications in the SPS then the system design covers the documented system needs. This does not mean that the system *will* meet the performance specifications, it just means that there are no obvious holes. And, of course, if some SPS specifications are not covered in the SSS then those specifications obviously cannot be met by the system design.

Since the SPS and SSS documents are all explicit statements of requirements, there can be no gaps between the specifications in them. If there is no mapping from at least one SSS requirement to each of the SPS requirements then the system cannot meet the stated requirements of the SPS. While the goal here is to ensure that the specifications of the SSS provide coverage to the higher document, true compliance can only be determined through design analysis and testing efforts. And, if there is an orphan SSS requirement then the questions must be asked: “Why is this requirement included?” and “Can this requirement be deleted?”. Taken together, the SPS and SSS documents can form the basis for a well-formed design artifact set: References to higher-level artifacts document where the system goals came from and the code (and hardware) level artifacts (source code and CAD models) should describe the final product details. Coupled with appropriate test documents, this level of design process and documentation generation should adequately allow for successful development while preserving the architectural aspects for future revisions and modifications.

Because this is the overall system / subsystem specification, this document provides traceability to miscellaneous project documents. This allows for tracking of vendor and draft specification requirements as the document is being created.

1.3.5 Document Production

The editing and document preparation were performed using MiKTeX version 2.9 with the build option [L^AT_EX \Rightarrow PS \Rightarrow PDF]. The L^AT_EX_{svn-multi} package was used to glean SVN tracking information, when files are stored in an “SVN” version control system. The style KNEADdocument, which was based on the style provided in [ref`thesisguide], was used to provide the L^AT_EX and BibLaTeX/Biber formatting details.

CHAPTER 2

References

ALL-2.0.0 :: THIS SECTION SHALL LIST THE NUMBER, TITLE, REVISION, AND DATE OF ALL DOCUMENTS REFERENCED IN THIS SPECIFICATION. THIS SECTION SHALL ALSO IDENTIFY THE SOURCE FOR ALL DOCUMENTS NOT AVAILABLE THROUGH NORMAL GOVERNMENT STOCKING ACTIVITIES. IT ALSO SHALL INCLUDE A LIST OF ACRONYMS AND GLOSSARY TERMS SO THAT THEY ARE DEFINED BEFORE USE.

This section provides a list of referenced items for this document.

2.1 Acronyms and Abbreviations

ALL-2.1.0 :: THIS SECTION SHALL CONTAIN A FULL LIST OF DEFINITIONS FOR ALL ACRONYMS AND ABBREVIATIONS USED IN THIS DOCUMENT. THESE ARE OFTEN INCLUDED IN AN APPENDIX BUT ARE INCLUDED IN CHAPTER 2 ALONG WITH GLOSSARY TERMS AND CITED REFERENCES TO PRESENT THE READER WITH THE INFORMATION BEFORE IT IS NEEDED.

This section defines acronyms and abbreviations used in this and related documents.

Table 1: Acronym Definitions

Acronym	Definition
ADC	Analog to Digital Converter
A/V	Audio / Visual
End of acronym definition table	

2.2 Glossary and Definitions

ALL-2.2.0 :: THIS SECTION SHALL CONTAIN A FULL LIST OF GLOSSARY DEFINITIONS FOR ALL SPECIALTY TERMS USED IN THIS DOCUMENT. THESE ARE OFTEN INCLUDED IN AN APPENDIX BUT ARE INCLUDED IN CHAPTER 2 ALONG WITH ACRONYMS / ABBREVIATIONS AND CITED REFERENCES AND GLOSSARY TERMS TO PRESENT THE READER WITH THE INFORMATION BEFORE IT IS NEEDED.

This section defines glossary terms used in this and related documents.

Table 2: Glossary Terms and Definitions

Glossary Term	Definition
Communications	Communication is information transfer, among users or processes, according to agreed conventions.
Glossary terms continue on next page	

Glossary terms – continued from previous page

Glossary Term	Definition
Customer	The local government project lead who is acting as a general manager for the sponsor to ensure that the contractor team executes the project according to stakeholder goals.
End of glossary terms table	

2.3 Referenced Documents

ALL-2.3.0 :: THIS SECTION SHALL CONTAIN A FULL LIST OF ALL ARTIFACTS REFERENCED FROM WITHIN THIS DOCUMENT. THESE ARE OFTEN INCLUDED IN A FINAL CHAPTER/SECTION OR APPENDIX BUT ARE INCLUDED IN CHAPTER 2 ALONG WITH ACRONYMS / ABBREVIATIONS AND GLOSSARY TERMS TO PRESENT THE READER WITH THE INFORMATION BEFORE IT IS NEEDED.

This section lists the referenced documents for this document. The references are categorized into two categories:

External Documents not directly associated with this project.

Project Documents that are directly associated with this project.

2.3.1 External Documents**2.3.2 Project Specific Documents**

CHAPTER 3

Requirements

SSS-3.0.0 :: THIS CHAPTER SHALL BE DIVIDED INTO THE FOLLOWING SECTIONS TO SPECIFY THE SYSTEM REQUIREMENTS, THAT IS, THOSE CHARACTERISTICS OF THE SYSTEM THAT ARE CONDITIONS FOR ITS ACCEPTANCE. EACH REQUIREMENT SHALL BE ASSIGNED A PROJECT-UNIQUE IDENTIFIER TO SUPPORT TESTING AND TRACEABILITY AND SHALL BE STATED IN SUCH A WAY THAT AN OBJECTIVE TEST CAN BE DEFINED FOR IT. EACH REQUIREMENT SHALL BE ANNOTATED WITH ASSOCIATED QUALIFICATION METHOD(S) (SEE SECTION 4) AND, FOR SUBSYSTEMS, TRACEABILITY TO SYSTEM REQUIREMENTS (SEE SECTION 5.A), IF NOT PROVIDED IN THOSE SECTIONS. THE DEGREE OF DETAIL TO BE PROVIDED SHALL BE GUIDED BY THE FOLLOWING RULE: INCLUDE THOSE CHARACTERISTICS OF THE SYSTEM THAT ARE CONDITIONS FOR SYSTEM ACCEPTANCE; DEFER TO DESIGN DESCRIPTIONS THOSE CHARACTERISTICS THAT THE ACQUIRER IS WILLING TO LEAVE UP TO THE DEVELOPER. IF THERE ARE NO REQUIREMENTS IN A GIVEN PARAGRAPH, THE PARAGRAPH SHALL SO STATE. IF A GIVEN REQUIREMENT FITS INTO MORE THAN ONE PARAGRAPH, IT MAY BE STATED ONCE AND REFERENCED FROM THE OTHER PARAGRAPHS.

This section provides the requirements that drive the design and implementation of the Smart-Silvia-Sys. These specifications are divided into the major segments of the system. Each requirement is listed in the segment that provides the specified capability, thus this section provides an immediate mapping of implementation requirements to the segment in which each requirement is met. Each requirement also includes traceability to high-level requirements that drive the specific capability. Validation methodology is provided here but verification traceability is provided in the STS artifacts.

The requirements also are specified in an order that generally allows for all precursor requirements to be stated before they are needed by a successor requirement. Thus, States and Modes are defined at the onset so that they can be used to regulate when external interfaces and processing steps may occur. Likewise, external interfaces are described so that the data from the interfaces may be used in, or created by, the ensuing processing. Once the processing is specified, the internal interface and data requirements are listed, showing how the overall system segments tie together. The remainder of the sections follow a somewhat similar pattern, but these latter sections contain disparate requirements that are separated and organized in a standard way so the contents can be easily scanned to locate specific requirements based on their type and expected location within the SSS.

These specifications also include qualifications for both Threshold (must meet) and Objective (want to meet) requirements for Smart-Silvia-Sys. The reader is cautioned to ensure that the requirement details be understood for the two modifiers.

Because this artifact specifies the segments for a Family of Systems (FoS), there are some specifications that include references to variants within the FoS. This allows for a single SSS to be created that covers all variants of the family. While this approach consolidates documentation, care must be taken to ensure comprehension of applicable specifications for each variant, as also must be done for statement of Threshold and Objective qualifiers.

3.1 States and Modes

SSS-3.1.0 :: IF THE SYSTEM IS REQUIRED TO OPERATE IN MORE THAN ONE STATE OR MODE HAVING REQUIREMENTS DISTINCT FROM OTHER STATES OR MODES, THIS SECTION SHALL IDENTIFY AND DEFINE EACH STATE AND MODE. EXAMPLES OF STATES AND MODES INCLUDE: IDLE, READY, ACTIVE, POST USE ANALYSIS, TRAINING, DEGRADED, EMERGENCY, BACKUP, WARTIME, PEACETIME. THE DISTINCTION BETWEEN STATES AND MODES IS ARBITRARY. A SYSTEM MAY BE DESCRIBED IN TERMS OF STATES ONLY, MODES ONLY, STATES WITHIN MODES, MODES WITHIN STATES, OR ANY OTHER SCHEME THAT IS USEFUL. IF NO STATES OR MODES ARE REQUIRED, THIS PARAGRAPH SHALL SO STATE, WITHOUT THE NEED TO CREATE ARTIFICIAL DISTINCTIONS. IF STATES AND/OR MODES ARE REQUIRED, EACH REQUIREMENT OR GROUP OF REQUIREMENTS IN THIS SPECIFICATION SHALL BE CORRELATED TO THE STATES AND MODES. THE CORRELATION MAY BE INDICATED BY A TABLE OR OTHER METHOD IN THIS PARAGRAPH, IN AN APPENDIX REFERENCED FROM THIS PARAGRAPH, OR BY ANNOTATION OF THE REQUIREMENTS IN THE PARAGRAPHS WHERE THEY APPEAR.

This section lists the states, sub-states, modes, and sub-modes that are provided by the system. While these terms can be construed in many ways, for this document, the following meanings are used:

States are the basic configurations of the system.

Sub-states are the effective state of being for the system.

Modes are the basic functions to be performed by the system when in a given state and/or sub-state.

Sub-modes if listed, are specific function modifications to be performed by the system within the given mode/function.

3.1.1 BDP-Light

A summary of the modes for each sub-state and state is provided in Table ?? below. The table provides a quick summary. A check mark (✓) designates a system capability, while an x mark (✗) designates an inability. See the specifications in the following sections for formal statement of the states and modes requirements, and accompanying notes that provide further clarification on the meanings of the states, sub-states, and modes.

STATES		
	Single Mode Broadcast	Multi-Mode Broadcast
MODES Sub Modes		
Radio		
AM	X	X
FM	✓1 channel	X
SW	X	X
TV		
Analog	X	X
Digital	X	X
Cellular		
SMS	✓1 band	X
MMS	X	X
CBS	X	X

Table 3: Summary of States, Modes, and Sub-Modes for the Light Variant

3.1.1.1 States

This section provides the system states. System states are the basic states for the system.

Specification 3.1.1.1.1 Single Mode Broadcast	
Text	The system shall be capable of Single Mode Broadcast.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Single Mode Broadcast state describes the system capability of broadcasting in a single mode. This includes multi-channel, multi-frequency, and multi-band broadcasts with the same messaging.

3.1.1.2 Modes

This section provides the system modes. System modes are the top-level functions to be performed by the system. The modes are by system states but may be qualified further by the sub-states. The modes describe the capabilities irrespective of the temporal processing constraints.

3.1.1.2.1 Radio Modes

This section provides the system Radio modes.

Specification 3.1.1.2.1.1 Mode Radio Broadcast

Text	The BDP-Light system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Radio Broadcast Mode describes the case where the system broadcasts analog radio. 2. Only the sub-mode of FM shall be provided.

3.1.1.2.2 Cellular Modes

This section provides the system Cellular modes.

Specification 3.1.1.2.2.1 Mode Cellular Dissemination

Text	The BDP-Light system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Cellular Dissemination Mode generalizes the case where the system disseminates cellular messages. 2. Only the sub-mode of SMS shall be provided.

3.1.1.3 Sub-Modes

This section provides the system sub-modes. System sub-modes, if listed, are the specific functions to be performed by the system. The sub-modes are defined for each system mode.

3.1.1.3.1 Radio Sub-Modes

Specification 3.1.1.3.1.1 Sub-Mode FM Radio Broadcast	
Text	The BDP-Light system shall provide the FM Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the FM radio spectrum.

Specification 3.1.1.3.1.2 Sub-Mode FM Radio Broadcast With RDS/RBDS	
Text	The BDP-Light system shall provide the FM Radio Broadcast with RDS/RBDS Sub-channel Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Broadcast with RDS/RBDS Subchannel Sub-Mode functions identically to the FM Radio Broadcast Sub-Mode with the addition of a transmitted RDS/RBDS subchannel.

3.1.1.3.2 Cellular Sub-Modes

Specification 3.1.1.3.2.1 Sub-Mode SMS Messaging	
Text	The BDP-Light system shall provide the SMS Messaging Dissemination Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The SMS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates SMS messages.

3.1.2 BDP-Medium

A summary of the modes for each sub-state and state is provided in Table ?? below. The table provides a quick summary. A check mark (✓) designates a system capability, while an x mark (✗) designates an inability. See the specifications in the following sections for formal statement of the states and modes requirements, and accompanying notes that provide further clarification on the meanings of the states, sub-states, and modes.

STATES		
Single Mode Broadcast Multi-Mode Broadcast		
MODES Sub Modes		
Radio		
AM	✓1 channel	✓
FM	✓4 channels	✓
SW	✓	✓
TV	✓3 channels	
Analog	✓	✓
Digital	✓	✓
Cellular		
SMS	✓2 bands	✓
MMS	✓	✓
CBS	✓	✓

Table 4: Summary of States, Modes, and Sub-Modes for the Medium Variant

3.1.2.1 States

This section provides the system states. System states are the basic states for the system.

Specification 3.1.2.1.1 Single Mode Broadcast	
Text	The BDP-Medium system shall be capable of Single Mode Broadcast.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Single Mode Broadcast state describes the system capability of broadcasting in a single mode. This includes multi-channel, multi-frequency, and multi-band broadcasts with the same messaging.

Specification 3.1.2.1.2 Multi-Mode Broadcast	
Text	The BDP-Medium system shall be capable of Multi-Mode Broadcast.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Multi-Mode Broadcast state describes the system capability of broadcasting simultaneously across all applicable modes.

3.1.2.2 Sub-States

This section provides the system sub-states. System sub-states are defined by the operational configuration. The sub-states are defined for each system configuration state.

Specification 3.1.2.2.1 Sub-State FM Radio and SMS Dissemination	
Text	The BDP-Medium system shall be capable of simultaneously broadcasting both FM radio signals and SMS dissemination.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

Specification 3.1.2.2.2 Sub-State FM and AM Radio Broadcast

Text	The BDP-Medium system shall be capable of simultaneously broadcasting both FM and AM radio signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.1.2.2.3 Sub-State FM Radio and TV Broadcast

Text	The BDP-Medium system shall be capable of simultaneously broadcasting FM radio and TV signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The TV broadcast includes analog and/or digital TV channels.

Specification 3.1.2.2.4 Sub-State FM and SW Radio Broadcast

Text	The BDP-Medium system shall be capable of simultaneously broadcasting FM and SW radio signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.1.2.3 Modes

This section provides the system modes. System modes are the top-level functions to be performed by the system. The modes are by system states but may be qualified further by the sub-states. The modes describe the capabilities irrespective of the temporal processing constraints.

3.1.2.3.1 Radio Modes

This section provides the system Radio modes.

Specification 3.1.2.3.1.1 Mode Radio Broadcast

Text	The BDP-Medium system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The Radio Broadcast Mode describes the case where the system broadcasts analog radio.2. Sub-modes of AM, SW, and FM broadcast shall be provided.3. All forms of radio broadcast shall include static RDS/RBDS text.

3.1.2.3.2 Television Modes

This section provides the system Television modes.

Specification 3.1.2.3.2.1 Mode Television Broadcast

Text	The BDP-Medium system shall provide the Television Broadcast Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The Television Broadcast Mode generalizes the case where the system provides single and multi-channel TV broadcasts.2. Sub-modes of analog and digital TV shall be provided.

3.1.2.3.3 Cellular Modes

This section provides the system Cellular modes.

Specification 3.1.2.3.3.1 Mode Cellular Dissemination

Text	The BDP-Medium system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Cellular Dissemination Mode generalizes the case where the system disseminates cellular messages. 2. Sub-modes of SMS, MMS, and CBS shall be provided.

3.1.2.4 Sub-Modes

This section provides the system sub-modes. System sub-modes, if listed, are the specific functions to be performed by the system. The sub-modes are defined for each system mode.

3.1.2.4.1 Radio Sub-Modes**Specification 3.1.2.4.1.1 Sub-Mode SW Radio Broadcast**

Text	The BDP-Medium system shall provide the SW Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The SW Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the shortwave radio spectrum.

Specification 3.1.2.4.1.2 Sub-Mode AM Radio Broadcast

Text	The BDP-Medium system shall provide the AM Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The AM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the AM radio spectrum.

Specification 3.1.2.4.1.3 Sub-Mode FM Radio Broadcast

Text	The BDP-Medium system shall provide the FM Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the FM radio spectrum.

Specification 3.1.2.4.1.4 Sub-Mode FM Radio Broadcast with RDS

Text	The BDP-Medium system shall provide the FM Radio Broadcast Sub-Mode with RDS text.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the FM radio spectrum.

Specification 3.1.2.4.1.5 Sub-Mode FM Radio Rebroadcast

Text	The BDP-Medium system shall provide the FM Radio Rebroadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Rebroadcast Sub-Mode generalizes the case where the system rebroadcasts FM radio programming.

3.1.2.4.2 TV Sub-Modes**Specification 3.1.2.4.2.1 Sub-Mode Analog TV**

Text	The BDP-Medium system shall provide the Analog TV Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Analog TV Sub-Mode generalizes the case where the system is broadcasting Analog TV signals.

Specification 3.1.2.4.2.2 Sub-Mode Digital TV

Text	The BDP-Medium system shall provide the Digital TV Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Digital TV Sub-Mode generalizes the case where the system is broadcasting Digital TV signals.

3.1.2.4.3 Cellular Sub-Modes

Specification 3.1.2.4.3.1 Sub-Mode SMS Messaging	
Text	The BDP-Medium system shall provide the SMS Messaging Dissemination Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The SMS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates SMS messages.

Specification 3.1.2.4.3.2 Sub-Mode MMS Messaging	
Text	The BDP-Medium system shall provide the MMS Messaging Dissemination Sub-Mode.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The MMS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates MMS messages.

Specification 3.1.2.4.3.3 Sub-Mode CBS Messaging	
Text	The BDP-Medium system shall provide the CBS Messaging Dissemination Sub-Mode.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The CBS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates CBS messages.

3.1.3 BDP-Heavy

A summary of the modes for each sub-state and state is provided in Table ?? below. The table provides a quick summary. A check mark (✓) designates a system capability, while an x mark (✗) designates an inability. See the specifications in the following sections for formal statement of the states and modes requirements, and accompanying notes that provide further clarification on the meanings of the states, sub-states, and modes.

STATES		
MODES Sub Modes	Single Mode Broadcast	Multi-Mode Broadcast
Radio		
AM	✓1 channel	✓
FM	✓4 channels	✓
SW	✓	✓
TV	✓3 channels	
Analog	✓	✓
Digital	✓	✓
Cellular		
SMS	✓2 bands	✓
MMS	✓	✓
CBS	✓	✓

Table 5: Summary of States, Modes, and Sub-Modes for the Heavy Variant

3.1.3.1 States

This section provides the system states. System states are the basic states for the system.

Specification 3.1.3.1.1 Single Mode Broadcast	
Text	The BDP-Heavy system shall be capable of Single Mode Broadcast.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Single Mode Broadcast state describes the system capability of broadcasting in a single mode. This includes multi-channel, multi-frequency, and multi-band broadcasts with the same messaging.

Specification 3.1.3.1.2 Multi-Mode Broadcast	
Text	The BDP-Heavy system shall be capable of Multi-Mode Broadcast.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Multi-Mode Broadcast state describes the system capability of broadcasting simultaneously across all applicable modes.

3.1.3.2 Sub-States

This section provides the system sub-states. System sub-states are defined by the operational configuration. The sub-states are defined for each system configuration state.

Specification 3.1.3.2.1 Sub-State FM Radio and SMS Dissemination	
Text	The BDP-Heavy system shall be capable of simultaneously broadcasting both FM radio signals and SMS dissemination.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

Specification 3.1.3.2.2 Sub-State FM and AM Radio Broadcast

Text	The BDP-Heavy system shall be capable of simultaneously broadcasting both FM and AM radio signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.1.3.2.3 Sub-State FM Radio and TV Broadcast

Text	The BDP-Heavy system shall be capable of simultaneously broadcasting FM radio and TV signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The TV broadcast includes analog and/or digital TV channels.

Specification 3.1.3.2.4 Sub-State FM and SW Radio Broadcast

Text	The BDP-Heavy system shall be capable of simultaneously broadcasting FM and SW radio signals.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.1.3.3 Modes

This section provides the system modes. System modes are the top-level functions to be performed by the system. The modes are by system states but may be qualified further by the sub-states. The modes describe the capabilities irrespective of the temporal processing constraints.

3.1.3.3.1 Radio Modes

This section provides the system Radio modes.

Specification 3.1.3.3.1.1 Mode Radio Broadcast

Text	The BDP-Heavy system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The Radio Broadcast Mode describes the case where the system broadcasts analog radio.2. Sub-modes of AM, SW, and FM broadcast shall be provided.3. All forms of radio broadcast shall include static RDS/RBDS text.

3.1.3.3.2 Television Modes

This section provides the system Television modes.

Specification 3.1.3.3.2.1 Mode Television Broadcast

Text	The BDP-Heavy system shall provide the Television Broadcast Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The Television Broadcast Mode generalizes the case where the system provides single and multi-channel TV broadcasts.2. Sub-modes of analog and digital TV shall be provided.

3.1.3.3.3 Cellular Modes

This section provides the system Cellular modes.

Specification 3.1.3.3.1 Mode Cellular Dissemination

Text	The BDP-Heavy system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The Cellular Dissemination Mode generalizes the case where the system disseminates cellular messages. 2. Sub-modes of SMS, MMS, and CBS shall be provided.

3.1.3.4 Sub-Modes

This section provides the system sub-modes. System sub-modes, if listed, are the specific functions to be performed by the system. The sub-modes are defined for each system mode.

3.1.3.4.1 Radio Sub-Modes**Specification 3.1.3.4.1.1 Sub-Mode SW Radio Broadcast**

Text	The BDP-Heavy system shall provide the SW Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The SW Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the shortwave radio spectrum.

Specification 3.1.3.4.1.2 Sub-Mode AM Radio Broadcast

Text	The BDP-Heavy system shall provide the AM Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The AM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the AM radio spectrum.

Specification 3.1.3.4.1.3 Sub-Mode FM Radio Broadcast

Text	The BDP-Heavy system shall provide the FM Radio Broadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Broadcast Sub-Mode generalizes the case where the system is broadcasting in the FM radio spectrum.

Specification 3.1.3.4.1.4 Sub-Mode FM Radio Broadcast with RDS

Text	The BDP-Heavy system shall provide the FM Radio Broadcast Sub-Mode with RDS text.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The FM Radio Broadcast With RDS Sub-Mode generalizes the case where the system is broadcasting in the FM radio spectrum with RDS text.

Specification 3.1.3.4.1.5 Sub-Mode FM Radio Rebroadcast

Text	The BDP-Heavy system shall provide the FM Radio Rebroadcast Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.5 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The FM Radio Rebroadcast Sub-Mode generalizes the case where the system is rebroadcasting FM radio programming.

3.1.3.4.2 TV Sub-Modes**Specification 3.1.3.4.2.1 Sub-Mode Analog TV**

Text	The BDP-Heavy system shall provide the Analog TV Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The Analog TV Sub-Mode generalizes the case where the system is broadcasting Analog TV signals.

Specification 3.1.3.4.2.2 Sub-Mode Digital TV

Text	The BDP-Heavy system shall provide the Digital TV Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The Digital TV Sub-Mode generalizes the case where the system is broadcasting Digital TV signals.

3.1.3.4.3 Cellular Sub-Modes

Specification 3.1.3.4.3.1 Sub-Mode SMS Messaging	
Text	The BDP-Heavy system shall provide the SMS Messaging Dissemination Sub-Mode.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The SMS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates SMS messages.

Specification 3.1.3.4.3.2 Sub-Mode MMS Messaging	
Text	The BDP-Heavy system shall provide the MMS Messaging Dissemination Sub-Mode.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The MMS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates MMS messages.

Specification 3.1.3.4.3.3 Sub-Mode CBS Messaging	
Text	The BDP-Heavy system shall provide the CBS Messaging Dissemination Sub-Mode.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	3.2.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. The CBS Messaging Dissemination Sub-Mode generalizes the case where the system disseminates CBS messages.

3.2 External Interfaces

SSS-3.2.0 :: THIS SECTION LISTS THE EXTERNAL INTERFACES TO THE SYSTEM. THIS SECTION CAN BE ORGANIZED SIMPLY AS INPUTS AND OUTPUTS OR IN ANOTHER LOGICAL GROUPING. THE GOAL IS TO INTRODUCE ALL OF THE EXTERNAL INTERFACES SO THAT THEIR DATA CAN BE DEFINED BEFORE THE DATA IS USED IN THE PROCESSING SECTION. THIS SECTION IS DIVIDED AS NEEDED TO SPECIFY THE REQUIREMENTS, IF ANY, FOR THE SYSTEM'S EXTERNAL INTERFACES. THIS SECTION MAY REFERENCE ONE OR MORE INTERFACE REQUIREMENTS SPECIFICATION (IRS) OR OTHER DOCUMENTS CONTAINING THESE REQUIREMENTS.

The external interfaces for this system are shown in Figure ???. The requirements for these interfaces are described in more detail in the following sections.

Operator The operator(s) that control the Smart-Silvia-Sys, § ??

Network The network that connects the Smart-Silvia-Sys components, § ??

Media The external media supported by the Smart-Silvia-Sys, § ??

Radio Rebroadcast The external media sources supported by the Smart-Silvia-Sys that provide content for rebroadcasting, § ??

Interference Sources The devices that emit signals that interfere with the Smart-Silvia-Sys, § ??

Audience The devices that receive broadcast signals from the Smart-Silvia-Sys, § ??

3.2.1 Operator Interfaces

This section provides the specifications for equipment that provides interfaces between the system operators and the Smart-Silvia-Sys. The equipment to which the system provides human interfaces are:

Graphical User Interface The user interface for the Smart-Silvia-Sys operations, § ??

Command Line The user environment for navigating the MPC laptop's operating system, § ??



Figure 2: System Context Diagram (DFD-C)

3.2.1.1 Graphical User Interface

Specification 3.2.1.1.1 Graphical User Interface	
Text	All BDP system variants shall provide a user interface as defined in the Smart-Silvia-Sys SUM.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	N/A This requirement is a base requirement.
Notes	1. N/A

3.2.1.2 Command Line

Specification 3.2.1.2.1 Command Line Environment	
Text	All BDP system variants shall have a command line environment for authorized users to access the operating system architecture.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	N/A This requirement is a base requirement.
Notes	1. N/A

3.2.2 Network Interfaces

Specification 3.2.2.1 Approved Network	
Text	All BDP system variants shall be capable of connecting to an approved network.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.18 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 7.0 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.3 Media

Specification 3.2.3.1 Media Sources	
Text	All BDP system variants shall be capable of manually ingesting media from different sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.13 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Includes Bluray, CD, DVD, and SD card. 2. Includes downloads to the Laptop from Internet sources when not connected to BDP.

Specification 3.2.3.2 IP Stream	
Text	All BDP system variants shall be capable of receiving and processing a pre-encoded IP stream.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.4 Rebroadcast Receive

Specification 3.2.4.1 Radio Rebroadcast	
Text	All BDP system variants shall be capable of receiving an FM radio program and storing the content for later rebroadcasting.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The receiving bandwidth is operator selectable and limited to a maximum of 150 KHz. 2. The recording time is operator selectable and limited to a maximum of 10 minutes (36 GB of data).

3.2.5 Interference

This section provides the sources of possible RF interference with the components of the Smart-Silvia-Sys in different RF bands. These sources may be generated internally and externally to the Smart-Silvia-Sys. Interfering signals coupling to the transmitted signals lower the SNR for the audience radio receivers which reduces range. Transmission of signals outside the presumed signal bandwidth may cause inference with other legitimate communication systems. Interference influences the Smart-Silvia-Sys component layout, cabling, filtering, and antenna positioning. The RF bands that the system provides are:

AM The AM radio broadcast band of the Smart-Silvia-Sys, § ??

SW The short wave radio broadcast band of the Smart-Silvia-Sys, § ??

FM The FM radio broadcast band of the Smart-Silvia-Sys, § ??

VHF The VHF TV broadcast band of the Smart-Silvia-Sys, § ??

UHF The UHF TV and Cellular broadcast band of the Smart-Silvia-Sys, § ??

3.2.5.1 AM Interference

3.2.5.1.1 BDP-Medium AM Interference

Specification 3.2.5.1.1.1 AM Self-Generated Interference	
Text	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Outside the channel, the radiated emission levels will comply with FCC 73.44 AM transmission emission limitations. 2. The AM band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.1.1.2 AM External Interference

Text	The BDP-Medium system shall maintain AM broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Compliance specified in FCC 15.5.2. Includes reception of interference on Smart-Silvia-Sys antenna(s).3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords.4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.1.2 BDP-Heavy AM Interference**Specification 3.2.5.1.2.1 AM Self-Generated Interference**

Text	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Outside the channel, the radiated emission levels will comply with FCC 73.44 AM transmission emission limitations.2. The AM band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.1.2.2 AM External Interference

Text	The BDP-Heavy system shall maintain AM broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Compliance specified in FCC 15.5. 2. Includes reception of interference on Smart-Silvia-Sys antenna(s). 3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords. 4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.2 SW Interference

3.2.5.2.1 BDP-Medium SW Interference

Specification 3.2.5.2.1.1 SW Self-Generated Interference

Text	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Outside the channel, the radiated emission levels will comply with FCC 93.307(d) Amateur Radio Emission Standards. 2. The SW band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.2.1.2 SW External Interference

Text	The BDP-Medium system shall maintain SW broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Compliance specified in FCC 15.5.2. Includes reception of interference on Smart-Silvia-Sys antenna(s).3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords.4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.2.2 BDP-Heavy SW Interference**Specification 3.2.5.2.2.1 SW Self-Generated Interference**

Text	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Outside the channel, the radiated emission levels will comply with FCC 93.307(d) Amateur Radio Emission Standards.2. The SW band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.2.2.2 SW External Interference

Text	The BDP-Heavy system shall maintain SW broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Compliance specified in FCC 15.5. 2. Includes reception of interference on Smart-Silvia-Sys antenna(s). 3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords. 4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.3 FM Interference

Specification 3.2.5.3.1 FM Self-Generated Interference

Text	All BDP system variants shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Outside the channel, the radiated emission levels will comply with FCC 73.317 FM transmission system requirements. 2. The FM band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.3.2 FM External Interference

Text	All BDP system variants shall maintain FM broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Compliance specified in FCC 15.5. 2. Includes reception of interference on Smart-Silvia-Sys antenna(s). 3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords. 4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.4 VHF Interference

3.2.5.4.1 BDP-Medium VHF Interference

Specification 3.2.5.4.1.1 VHF Self-Generated Interference

Text	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Outside the channel, the radiated emission levels will comply with FCC 73.687 Transmission system requirements. 2. The VHF band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.4.1.2 VHF External Interference

Text	The BDP-Medium system shall maintain VHF broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Compliance specified in FCC 15.5. 2. Includes reception of interference on Smart-Silvia-Sys antenna(s). 3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords. 4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.4.2 BDP-Heavy VHF Interference

Specification 3.2.5.4.2.1 VHF Self-Generated Interference

Text	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. Outside the channel, the radiated emission levels will comply with FCC 73.687 Transmission system requirements. 2. The VHF band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.4.2.2 VHF External Interference

Text	The BDP-Heavy system shall maintain VHF broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Compliance specified in FCC 15.5.2. Includes reception of interference on Smart-Silvia-Sys antenna(s).3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords.4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.5.5 UHF Interference**Specification 3.2.5.5.1 UHF Self-Generated Interference**

Text	All BDP system variants shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Outside the channel, the radiated emission levels will comply with FCC 73.687 Transmission system requirements.2. The UHF band the conducted emission levels will comply with FCC 15.207 Conducted limits.

Specification 3.2.5.5.2 UHF External Interference	
Text	All BDP system variants shall maintain UHF broadcast operation in the presence of interference generated by external sources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Compliance specified in FCC 15.5.2. Includes reception of interference on Smart-Silvia-Sys antenna(s).3. Includes reception of interference on Smart-Silvia-Sys cabling and power cords.4. Includes noise from unintentional radiators, e.g. power supplies, electric motors, and spark plugs.

3.2.6 Target Audience

This section provides the specifications for the equipment that provide interfaces between the Smart-Silvia-Sys and the target audience.

The equipment to which the system provides human interfaces are:

Omnidirectional Antenna delivers the transmission to a target audience in all directions from the transmitting source, § ??.

Directional Antenna delivers the transmission to a target audience in a directional pattern from the transmitting source, § ??.

3.2.6.1 Omnidirectional Antenna

3.2.6.1.1 BDP-Medium Omnidirectional AM

Specification 3.2.6.1.1.1 Omnidirectional AM	
Text	The BDP-Medium system shall deliver an AM transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. N/A

3.2.6.1.2 BDP-Heavy Omnidirectional AM

Specification 3.2.6.1.2.1 Omnidirectional AM	
Text	The BDP-Heavy system shall deliver an AM transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.3 BDP-Medium Omnidirectional SW

Specification 3.2.6.1.3.1 Omnidirectional SW	
Text	The BDP-Medium system shall deliver an SW transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.4 BDP-Heavy Omnidirectional SW

Specification 3.2.6.1.4.1 Omnidirectional SW	
Text	The BDP-Heavy system shall deliver an SW transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.5 Omnidirectional FM

Specification 3.2.6.1.5.1 Omnidirectional FM	
Text	All BDP system variants shall deliver an FM transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.6 BDP-Medium Omnidirectional VHF

Specification 3.2.6.1.6.1 Omnidirectional VHF	
Text	The BDP-Medium system shall deliver an VHF transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.7 BDP-Heavy Omnidirectional VHF

Specification 3.2.6.1.7.1 Omnidirectional VHF	
Text	The BDP-Heavy system shall deliver an VHF transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.2.6.1.8 Omnidirectional UHF

Specification 3.2.6.1.8.1 Omnidirectional UHF	
Text	All BDP system variants shall deliver a UHF transmission to an audience in all directions from the transmitting source.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. N/A

3.2.6.2 Directional Antenna

3.2.6.2.1 BDP-Medium Directional SW

Specification 3.2.6.2.1.1 Directional SW	
Text	The BDP-Medium system shall deliver a SW transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the SW transmission shall reach at least 600 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.2 BDP-Heavy Directional SW

Specification 3.2.6.2.2.1 Directional SW	
Text	The BDP-Heavy system shall deliver a SW transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the SW transmission shall reach at least 600 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.3 BDP-Light Directional FM

Specification 3.2.6.2.3.1 Directional FM	
Text	The BDP-Light system shall deliver an FM transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the FM transmission shall reach at least 5 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.4 BDP-Medium Directional FM

Specification 3.2.6.2.4.1 Directional FM	
Text	The BDP-Medium system shall deliver an FM transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the FM transmission shall reach at least 12 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.5 BDP-Heavy Directional FM

Specification 3.2.6.2.5.1 Directional FM	
Text	The BDP-Heavy system shall deliver an FM transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the FM transmission shall reach at least 35 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.6 BDP-Medium Directional VHF

Specification 3.2.6.2.6.1 Directional VHF	
Text	The BDP-Medium system shall deliver a VHF transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the VHF transmission shall reach at least 5 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref"BDP"FOSSCDD].

3.2.6.2.7 BDP-Heavy Directional VHF

Specification 3.2.6.2.7.1 Directional VHF	
Text	The BDP-Heavy system shall deliver a VHF transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the VHF transmission shall reach at least 10 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref"BDP"FOSSCDD].

3.2.6.2.8 BDP-Light Directional UHF

Specification 3.2.6.2.8.1 Directional UHF	
Text	The BDP-Light system shall deliver a UHF transmission to an audience in a directional pattern from the transmitting source.
Specifics	1. The range of the UHF cellular transmission shall reach at least 5 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.3 Section in CDD for BDP FoS [ref"BDP"FOSSCDD].

3.2.6.2.9 BDP-Medium Directional UHF

Specification 3.2.6.2.9.1 Directional UHF	
Text	The BDP-Medium system shall deliver a UHF transmission to an audience in a directional pattern from the transmitting source.
Specifics	<ol style="list-style-type: none">1. The range of the UHF TV transmission shall reach at least 5 miles.2. The range of the UHF cellular transmission shall reach at least 8 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.2.6.2.10 BDP-Heavy Directional UHF

Specification 3.2.6.2.10.1 Directional UHF	
Text	The BDP-Heavy system shall deliver a UHF transmission to an audience in a directional pattern from the transmitting source.
Specifics	<ol style="list-style-type: none">1. The range of the UHF TV transmission shall reach at least 10 miles.2. The range of the UHF cellular transmission shall reach at least 8 miles.
Acceptance	This requirement shall be verified by demonstration.
Status	Phase 1 Threshold
Traceability	5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].

3.3 Capabilities

SSS-3.3.0 :: THIS SECTION SHALL BE DIVIDED INTO SUBPARAGRAPHS TO ITEMIZE THE REQUIREMENTS ASSOCIATED WITH EACH CAPABILITY OF THE SYSTEM. A “CAPABILITY” IS DEFINED AS A GROUP OF RELATED REQUIREMENTS. THE WORD “CAPABILITY” MAY BE REPLACED WITH “FUNCTION”, “SUBJECT”, “OBJECT”, OR OTHER TERM USEFUL FOR PRESENTING THE REQUIREMENTS.

This section defines the capability segments for the Smart-Silvia-Sys. The segment design is structured to meet the requirements as specified in [ref*BDP*FOS*CDD]. Each segment provides a subset of the overall capabilities for the Smart-Silvia-Sys segments. These segments are shown in Figure ??, are summarized below, and are more fully specified in the following subsections.

The capability requirements for these segments are described in more detail in the following sections:



Figure 3: System Top-Level Diagram (DFD-0)

Control Processing handles the HMI interface to the operator and provides overall control and configuration to the Smart-Silvia-Sys, § ??.

Media Processing receives digital media content that is stored and later directed to the Waveform Processing for dissemination, § ??.

Waveform Processing receives digital media streams, converts the stream to the proper transmission format, modulates the stream on an RF carrier signal, and converts the RF signal into the analog RF Broadcast Pre-Amp Data output, § ??.

RF Processing provides amplification and filtering for outbound RF signals to be broadcast to the target audience and necessary filtering and LNA services for inbound RF signals, § ??.

3.3.1 Control Processing

The Smart-Silvia-Sys capability meets the following specification groups:

Operator the personnel responsible for operating the Smart-Silvia-Sys, § ??.

3.3.1.1 Operator

3.3.1.1.1 Remote Device

Specification 3.3.1.1.1.1 Remote Device	
Text	The system operator shall be able to control the system broadcasts using a device with a wired or wireless connection at a standoff distance of at least 100m.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.18 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

3.3.1.1.2 BDP-Medium Propagation Modeling

Specification 3.3.1.1.2.1 Propagation Modeling	
Text	The BDP-Medium system shall visually depict the RF propagation on a device.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.19 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Where does this information come from? ...TBD...

3.3.1.1.3 BDP-Heavy Propagation Modeling

Specification 3.3.1.1.3.1 Propagation Modeling	
Text	The BDP-Heavy system shall visually depict the RF propagation on a device.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.19 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Where does this information come from? ...TBD...

3.3.2 Media Processing

The Smart-Silvia-Sys capability is segmented into the following specification groups:

Media Input Processing controls the ingest, conversion, and storage of media files in preparation for dissemination, § ??.

Media Output Processing controls the media file selection, stream conversion, and dissemination of the Media Broadcast Data, § ??.

Report Processing controls the storage and access to Smart-Silvia-Sys reports, § ??.

3.3.2.1 Media Input Processing

Specification 3.3.2.1.1 Media Source Data Input	
Text	All BDP system variants shall ingest A/V files encoded in common file formats; convert them to a common format; and store for future dissemination.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.13 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Video input file formats are mp4, mpeg, mpg, and mpv.2. Audio input file formats are mp3 and wav.3. Audio extraction from the input video file formats.4. The video file storage format is (MPEG-2 or 4 ???).5. The audio file storage format is (MPEG-2 or 4 ???).

Specification 3.3.2.1.2 Media Rebroadcast Data Input

Text	All BDP system variants shall ingest an FM demodulated digital stream; convert stream to a common format; and store in a file for future dissemination.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The FM Rebroadcast Data stream is the digital capture of up to 150 KHz of the FM Broadcast spectrum.2. The Rebroadcast Data file format is the lossless (???) format.

Specification 3.3.2.1.3 Media Control Input

Text	The media processing ingest, storage, and broadcast, along with log file storage, shall be controlled by the Media Control inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.11 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.13 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.18 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.20 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.22 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. Media Control inputs are determined by current BDP-FoS States and Modes, along with current system operational status and Operator input.2. Media Control input will also contain data stored in log files.

3.3.2.2 Media Output Processing

Specification 3.3.2.2.1 Media Broadcast Data Output	
Text	All BDP system variants shall stream the Media Broadcast Data created from the stored media files for dissemination.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.14 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Includes the stored Media Rebroadcast Data.

Specification 3.3.2.2.2 Media Control Output	
Text	All BDP system variants shall convey the progress, status, and content of the Media Processing, stored media files, and stored log files.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.11 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.13 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.15 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.18 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.20 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.22 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Media Control outputs are determined by current BDP-FoS States and Modes, along with current system operational status and Operator input.

3.3.2.3 Report Processing

Specification 3.3.2.3.1 Cellular Survey Data	
Text	All BDP system variants shall store and retrieve cellular site survey information in a file.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.22 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. To aid Smart-Silvia-Sys operations and planning.

Specification 3.3.2.3.2 BIT Result Data	
Text	All BDP system variants shall store and retrieve the results of BIT in a file.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.15 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. To aid Smart-Silvia-Sys operations and system troubleshooting.

Specification 3.3.2.3.3 Operational Data Report	
Text	All BDP system variants shall store and retrieve the operational reports.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.20 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	1. To aid Smart-Silvia-Sys maintenance operations and system troubleshooting.

Specification 3.3.2.3.4 Maintenance Data Report

Text	All BDP system variants shall store and retrieve the maintenance reports.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. To aid Smart-Silvia-Sys maintenance operations and system troubleshooting.

3.3.3 Waveform Processing

The individual waveform processing elements are determined by the Smart-Silvia-Sys variant and controlled by the current States, Sub-States, Modes, and Sub-Modes of the system. The Smart-Silvia-Sys Waveform Processing capability is segmented into the following specification groups:

AM provides the AM input and output waveform processing, § ??.

SW provides the SW input and output waveform processing, § ??.

FM provides the FM input and output waveform processing, § ??.

ATV provides the ATV input and output waveform processing, § ??.

DTV provides the DTV input and output waveform processing, § ??.

3.3.3.1 AM Waveform Processing

The Smart-Silvia-Sys AM Waveform Processing AM capability is divided into the following specification groups:

Transmission processing provides the AM broadcast output waveform processing capability.

VSWR processing provides the AM broadcast VSWR processing capability.

An overview of the processing performed by these groups is shown in Figure ??.



Figure 4: AM Waveform Processing Overview

3.3.3.1.1 BDP-Medium AM Waveform Processing

3.3.3.1.1.1 BDP-Medium AM Waveform Transmission Processing

Specification 3.3.3.1.1.1 BDP-Medium AM Waveform Transmission Input Processing	
Text	The BDP-Medium system shall decode and transform the data stream into a discrete-time digital stream that is amplitude modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Amplitude Modulation (AM) in this case. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is amplitude modulated on the RF carrier to create the Audio Data stream output for the Transmission Output Processing. 4. The Waveform Control Input supplies the RF carrier frequency, modulation bandwidth, and modulation index information needed to produce the audio amplitude modulated RF waveform.

Specification 3.3.3.1.1.1.2 BDP-Medium AM Waveform Transmission Output Processing

Text	The BDP-Medium system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the AM Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The AM Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 10 dBm. 2. The average modulated RF output power level will be estimated for use internally during the AM Waveform VSWR Processing. 3. The Waveform Control Input supplies the RF carrier frequency information needed to upsample and filter the signal.

3.3.3.1.1.2 BDP-Medium AM Waveform VSWR Processing

Specification 3.3.3.1.1.2.1 BDP-Medium AM Waveform VSWR Input Processing	
Text	The BDP-Medium system shall calculate the Average Reflected Power from the AM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Amplitude Modulation (AM) in this case. 2. The Waveform Control Input supplies the RF carrier frequency and modulation bandwidth information needed to extract the reflected power from the AM Received RF Data input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.1.1.2.2 BDP-Medium AM Waveform VSWR Output Processing

Text	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The integration time from the Waveform Control Inputs determines number of samples used in the calculations and the update rate. 2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.1.2 BDP-Heavy AM Waveform Processing

3.3.3.1.2.1 BDP-Heavy AM Waveform Transmission Processing

Specification 3.3.3.1.2.1.1 BDP-Heavy AM Waveform Transmission Input Processing	
Text	The BDP-Heavy system shall decode and transform the data stream into a discrete-time digital stream that is amplitude modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Amplitude Modulation (AM) in this case. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is amplitude modulated on the RF carrier to create the Audio Data stream output for the Transmission Output Processing. 4. The Waveform Control Input supplies the RF carrier frequency, modulation bandwidth, and modulation index information needed to produce the audio amplitude modulated RF waveform.

Specification 3.3.3.1.2.1.2 BDP-Heavy AM Waveform Transmission Output Processing

Text	The BDP-Heavy system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the AM Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The AM Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 10 dBm. 2. The average modulated RF output power level will be estimated for use internally during the AM Waveform VSWR Processing. 3. The Waveform Control Input supplies the RF carrier frequency information needed to upsample and filter the signal.

3.3.3.1.2.2 BDP-Heavy AM Waveform VSWR Processing

Specification 3.3.3.1.2.2.1 BDP-Heavy AM Waveform VSWR Input Processing

Text	The BDP-Heavy system shall calculate the Average Reflected Power from the AM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.21 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Amplitude Modulation (AM) in this case. 2. The Waveform Control Input supplies the RF carrier frequency and modulation bandwidth information needed to extract the reflected power from the AM Received RF Data input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.1.2.2.2 BDP-Heavy AM Waveform VSWR Output Processing

Text	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The integration time from the Waveform Control Inputs determines number of samples used in the calculations and the update rate.2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.2 SW Waveform Processing

The Smart-Silvia-Sys SW Waveform Processing SW capability is divided into the following specification groups:

Transmission processing provides the SW broadcast transmission waveform processing capability.

VSWR processing provides the SW broadcast VSWR processing capability.

An overview of the processing performed by these groups is shown in Figure ??.



Figure 5: SW Waveform Processing Overview

3.3.3.2.1 BDP-Medium SW Waveform Processing

3.3.3.2.1.1 BDP-Medium SW Waveform Transmission Processing

Specification 3.3.3.2.1.1.1 BDP-Medium SW Waveform Transmission Input Processing	
Text	The BDP-Medium system shall decode and transform the data stream into a discrete-time digital stream that is modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Shortwave (SW) in this case. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is modulated according to the selected modulation method, on the RF carrier to create the Audio Data stream output for the Transmission Output Processing. 4. The Waveform Control Input supplies the RF carrier frequency, modulation bandwidth, modulation method, and modulation index information needed to produce the audio modulated RF waveform.

Specification 3.3.3.2.1.1.2 BDP-Medium SW Waveform Transmission Output Processing

Text	The BDP-Medium system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the SW Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The SW Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier (AM modulation method) output power level of 10 dBm. 2. The average modulated RF output power level will be estimated for use internally during the SW Waveform VSWR Processing. 3. The Waveform Control Input supplies the RF carrier frequency information needed to upsample and filter the signal.

3.3.3.2.1.2 BDP-Medium SW Waveform VSWR Processing

Specification 3.3.3.2.1.2.1 BDP-Medium SW Waveform VSWR Input Processing	
Text	The BDP-Medium system shall calculate the Average Reflected Power from the SW Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Shortwave (SW) in this case. 2. The Waveform Control Input supplies the RF carrier frequency and modulation bandwidth information needed to extract the reflected power from the SW Received RF Data input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.2.1.2.2 BDP-Medium SW Waveform VSWR Output Processing

Text	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The integration time from the Waveform Control Inputs determines number of samples used in the calculations and the update rate. 2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.2.2 BDP-Heavy SW Waveform Processing

3.3.3.2.2.1 BDP-Heavy SW Waveform Transmission Processing

Specification 3.3.3.2.2.1.1 BDP-Heavy SW Waveform Transmission Input Processing	
Text	The BDP-Heavy system shall decode and transform the data stream into a discrete-time digital stream that is modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Shortwave (SW) in this case. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is modulated according to the selected modulation method, on the RF carrier to create the Audio Data stream output for the Transmission Output Processing. 4. The Waveform Control Input supplies the RF carrier frequency, modulation bandwidth, modulation method, and modulation index information needed to produce the audio modulated RF waveform.

Specification 3.3.3.2.2.1.2 BDP-Heavy SW Waveform Transmission Output Processing

Text	The BDP-Heavy system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the SW Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The SW Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier (AM modulation method) output power level of 10 dBm. 2. The average modulated RF output power level will be estimated for use internally during the SW Waveform VSWR Processing. 3. The Waveform Control Input supplies the RF carrier frequency information needed to upsample and filter the signal.

3.3.3.2.2.2 BDP-Heavy SW Waveform VSWR Processing

Specification 3.3.3.2.2.1 BDP-Heavy SW Waveform VSWR Input Processing

Text	The BDP-Heavy system shall calculate the Average Reflected Power from the SW Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.21 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the Waveform Control Input selects the sub-mode, Shortwave (SW) in this case. 2. The Waveform Control Input supplies the RF carrier frequency and modulation bandwidth information needed to extract the reflected power from the SW Received RF Data input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.2.2.2 BDP-Heavy SW Waveform VSWR Output Processing	
Text	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The integration time from the Waveform Control Inputs determines number of samples used in the calculations and the update rate.2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.3 FM Waveform Processing

The Smart-Silvia-Sys FM Waveform Processing FM capability is divided into the following specification groups:

Receive processing provides the FM receive waveform processing capability.

Transmission processing provides the FM broadcast transmission waveform processing capability. This processing supports both the FM Radio Broadcast and FM Radio Broadcast with RDS/RBDS sub-modes. The difference between the two sub-modes is managed by two distinct Transmission Input Processing functions because of the additional RDS/RBDS information. For the case of rebroadcasting a received FM Rebroadcast, a third distinct Transmission Input Processing function is documented.

VSWR processing provides the FM broadcast VSWR processing capability.

An overview of the processing performed by these groups is shown in Figure ??.



Figure 6: FM Waveform Processing Overview

3.3.3.3.1 BDP-Light FM Waveform Processing

3.3.3.3.1.1 BDP-Light FM Waveform Transmission Processing

Specification 3.3.3.3.1.1 BDP-Light FM Waveform Transmission Input Processing	
Text	The BDP-Light system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Frequency Modulation (FM) in this case and an file to broadcast. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 4. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

Specification 3.3.3.3.1.1.2 BDP-Light FM Waveform Transmission Input Processing for FM with RDS/RBDS Sub-Mode

Text	The BDP-Light system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM with RDS. 2. The user entered RDS/RBDS text is differentially encoded, converted to bi-phase symbols, and mixed with a 57 subcarrier creating a DSB-SC modulated RDS/RBDS signal in the form of a discrete-time digital signal (analytic signal). 3. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. The audio analytic signal is then filtered, and pre-emphasis is applied. 4. The RDS/RBDS and audio analytic signals are summed together then FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 5. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

Specification 3.3.3.3.1.1.3 BDP-Light FM Waveform Transmission Output Processing

Text	The BDP-Light system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The FM Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 12 dBm. 2. The average modulated RF output power level will be estimated for use internally during the FM Waveform VSWR Processing.

3.3.3.3.1.2 BDP-Light FM Waveform VSWR Processing

Specification 3.3.3.3.1.2.1 BDP-Light FM Waveform VSWR Input Processing	
Text	The BDP-Light system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.21 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM or FM with RDS. 2. The inputs will supply the RF carrier frequency and frequency deviation information needed to extract the reflected power from the Received RF Data Input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.3.1.2.2 BDP-Light FM Waveform VSWR Output Processing

Text	The BDP-Light system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The integration time from the control inputs determines number of samples used in the calculations and the update rate. 2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.3.2 BDP-Medium FM Waveform Processing

3.3.3.3.2.1 BDP-Medium FM Waveform Receive Processing

Specification 3.3.3.3.2.1.1 BDP-Medium FM Waveform Receive Input Processing	
Text	The BDP-Medium system shall frequency demodulate a designated bandwidth and filter the FM Rebroadcast Received RF Data signal, then transform it into a discrete-time digital stream; all controlled by the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM Rebroadcast in this case. 2. The Control Inputs supply the RF carrier frequency, frequency deviation (bandwidth) needed to demodulate and filter the received FM signal. 3. The filtering is required to remove any received adjacent channels from the designated bandwidth.

Specification 3.3.3.3.2.1.2 BDP-Medium FM Waveform Receive Output Processing	
Text	The BDP-Medium system shall compress, format, and internally store in the Smart-Silvia-Sys the FM Rebroadcast discrete-time digital FM data stream.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The audio data will be compressed using a lossless format to maintain the entire bandwidth ensuring any subcarrier information present in the original received FM signal is preserved.

3.3.3.3.2.2 BDP-Medium FM Waveform Transmission Processing

Specification 3.3.3.3.2.1 BDP-Medium FM Waveform Transmission Input Processing	
Text	The BDP-Medium system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Frequency Modulation (FM) in this case and an file to broadcast. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 4. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

Specification 3.3.3.3.2.2.2 BDP-Medium FM Waveform Transmission Input Processing of Rebroadcast file for FM Sub-Mode

Text	The BDP-Medium system shall decompress the discrete-time digital FM data stream and FM modulate on the new RF carrier frequency creating the audio data output stream.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Frequency Modulation (FM) in this case and a compressed file to broadcast. 2. The recorded FM information is decompressed transforming it into a discrete-time digital representation (analytic signal) of the original baseband analog FM signal. 3. The analytic signal is FM modulated on the new RF carrier creating the Audio Data stream output for the Transmission Output Processing. 4. The Control Inputs supply the RF carrier frequency and frequency deviation information needed to reproduce the FM modulated RF waveform.

Specification 3.3.3.3.2.2.3 BDP-Medium FM Waveform Transmission Input Processing for FM with RDS/RBDS Sub-Mode

Text	The BDP-Medium system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.5 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM with RDS. 2. The user entered RDS/RBDS text is differentially encoded, converted to bi-phase symbols, and mixed with a 57 subcarrier creating a DSB-SC modulated RDS/RBDS signal in the form of a discrete-time digital signal (analytic signal). 3. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. The audio analytic signal is then filtered, and pre-emphasis is applied. 4. The RDS/RBDS and audio analytic signals are summed together then FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 5. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

Specification 3.3.3.3.2.2.4 BDP-Medium FM Waveform Transmission Output Processing

Text	The BDP-Medium system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> The FM Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 12 dBm. The average modulated RF output power level will be estimated for use internally during the FM Waveform VSWR Processing.

3.3.3.3.2.3 BDP-Medium FM Waveform VSWR Processing

Specification 3.3.3.3.2.3.1 BDP-Medium FM Waveform VSWR Input Processing	
Text	The BDP-Medium system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM or FM with RDS. 2. The inputs will supply the RF carrier frequency and frequency deviation information needed to extract the reflected power from the Received RF Data Input. 3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.3.2.3.2 BDP-Medium FM Waveform VSWR Output Processing

Text	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The integration time from the control inputs determines number of samples used in the calculations and the update rate. 2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.3.3 BDP-Heavy FM Waveform Processing

3.3.3.3.3.1 BDP-Heavy FM Waveform Receive Processing

Specification 3.3.3.3.3.1.1 BDP-Heavy FM Waveform Receive Input Processing

Text	The BDP-Heavy system shall frequency demodulate a designated bandwidth and filter the FM Rebroadcast Received RF Data signal, then transform it into a discrete-time digital stream; all controlled by the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM Rebroadcast in this case. 2. The Control Inputs supply the RF carrier frequency, frequency deviation (bandwidth) needed to demodulate and filter the received FM signal. 3. The filtering is required to remove any received adjacent channels from the designated bandwidth.

Specification 3.3.3.3.3.1.2 BDP-Heavy FM Waveform Receive Output Processing

Text	The BDP-Heavy system shall compress, format, and internally store in the Smart-Silvia-Sys the FM Rebroadcast discrete-time digital FM data stream.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The audio data will be compressed using a lossless format to maintain the entire bandwidth ensuring any subcarrier information present in the original received FM signal is preserved.

3.3.3.3.2 BDP-Heavy FM Waveform Transmission Processing

Specification 3.3.3.3.2.1 BDP-Heavy FM Waveform Transmission Input Processing	
Text	The BDP-Heavy system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Frequency Modulation (FM) in this case and an file to broadcast. 2. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. 3. The audio analytic signal is FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 4. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

**Specification 3.3.3.3.2.2 BDP-Heavy FM Waveform Transmission Input
Processing of Rebroadcast file for FM Sub-Mode**

Text	The BDP-Heavy system shall decompress the discrete-time digital FM data stream and FM modulate on the new RF carrier frequency creating the audio data output stream.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.12 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Frequency Modulation (FM) in this case and a compressed file to broadcast. 2. The recorded FM information is decompressed transforming it into a discrete-time digital representation (analytic signal) of the original baseband analog FM signal. 3. The analytic signal is FM modulated on the new RF carrier creating the Audio Data stream output for the Transmission Output Processing. 4. The Control Inputs supply the RF carrier frequency and frequency deviation information needed to reproduce the FM modulated RF waveform.

Specification 3.3.3.3.2.3 BDP-Heavy FM Waveform Transmission Input Processing for FM with RDS/RBDS Sub-Mode

Text	The BDP-Heavy system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.5 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, FM with RDS. 2. The user entered RDS/RBDS text is differentially encoded, converted to bi-phase symbols, and mixed with a 57 subcarrier creating a DSB-SC modulated RDS/RBDS signal in the form of a discrete-time digital signal (analytic signal). 3. The audio information is obtained by decoding the data stream, extracting the audio stream, and transforming it into a discrete-time digital representation (analytic signal) of the original analog audio signal. The audio analytic signal is then filtered, and pre-emphasis is applied. 4. The RDS/RBDS and audio analytic signals are summed together then FM modulated on the RF carrier creating the Audio Data stream output for the Transmission Output Processing. 5. The Control Inputs supply the RF carrier frequency, frequency deviation, and pre-emphasis information needed to produce the audio frequency modulated RF waveform.

Specification 3.3.3.3.2.4 BDP-Heavy FM Waveform Transmission Output Processing

Text	The BDP-Heavy system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The FM Waveform RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 12 dBm. 2. The average modulated RF output power level will be estimated for use internally during the FM Waveform VSWR Processing.

3.3.3.3.3 BDP-Heavy FM Waveform VSWR Processing**Specification 3.3.3.3.3.1 BDP-Heavy FM Waveform VSWR Input Processing**

Text	The BDP-Heavy system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD]. 5.5.21 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].
Notes	<ol style="list-style-type: none">1. This processing is enabled when the input selects the sub-mode, FM or FM with RDS.2. The inputs will supply the RF carrier frequency and frequency deviation information needed to extract the reflected power from the Received RF Data Input.3. A digitally sampled signal that represents the reflected RF signal is generated which is controlled by the carrier frequency and modulation bandwidth inputs.

Specification 3.3.3.3.3.2 BDP-Heavy FM Waveform VSWR Output Processing

Text	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. The integration time from the control inputs determines number of samples used in the calculations and the update rate.2. Low reflected power or high VSWR measurements will generate the fault notifications which will be used to disable the RF Broadcast Output. A low reflected power measurement while transmitting would indicate that no RF power is being transmitted.

3.3.3.4 Analog TV Waveform Processing

The Smart-Silvia-Sys ATV Waveform Processing ATV capability is divided into the following specification groups:

Transmission processing provides the ATV broadcast output waveform processing capability.

VSWR processing provides the ATV broadcast VSWR processing capability.

An overview of the processing performed by these groups is shown in Figure ??.



Figure 7: ATV Waveform Processing Overview

3.3.3.4.1 BDP-Medium ATV Waveform Processing

3.3.3.4.1.1 BDP-Medium ATV Waveform Transmission Processing

Specification 3.3.3.4.1.1.1 BDP-Medium ATV Waveform Transmission Input Processing	
Text	The BDP-Medium system shall decode and transform the data stream into three separate (Video Data Streams) digital representations (discrete-time analytic signals) of the analog audio, analog video luma, and analog video chroma signals; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case. 2. The inputs will supply the ATV Video Standard, RF carrier frequency, and modulation bandwidth information needed to produce the modulated RF waveform. 3. The audio stream will be converted into digital samples (discrete-time analytic signal) that represent the original monaural analog audio signal. 4. The .MPEG video stream will be converted to separate luma and chroma interlaced video signals made up of digital sample streams that represent (discrete-time analytic signals) the two analog video signals. 5. The luma/chroma signals are YIQ format for NTSC, YU'V for PAL, and YDbDr for both SECAM and PAL-N.

Specification 3.3.3.4.1.1.2 BDP-Medium ATV Waveform Transmission Output Processing

Text	The BDP-Medium system shall use the digital audio, luma, and chroma signal streams along with the control inputs to modulate the video luma signal on the RF carrier, the chroma signal on the color subcarrier, and the audio on the audio subcarrier that are combined into the video signal that is then converted to an analog signal creating the RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 15 dBm. 2. The average modulated RF output power level will be estimated for use internally during the ATV Waveform VSWR Processing.

3.3.3.4.1.2 BDP-Medium ATV Waveform VSWR Processing

Specification 3.3.3.4.1.2.1 BDP-Medium ATV Waveform VSWR Input Processing	
Text	The BDP-Medium system shall calculate the Average Reflected Power from the ATV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case. 2. The inputs will supply the RF carrier frequency, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input.

Specification 3.3.3.4.1.2.2 BDP-Medium ATV Waveform VSWR Output Processing

Text	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case. 2. The inputs will supply the RF carrier frequency, modulation method, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input. 3. Low reflected power or high VSWR measurements will cause the RF Broadcast Pre-Amp Data Output to turn off and an error indication sent to the Waveform Control Outputs.

3.3.3.4.2 BDP-Heavy ATV Waveform Processing

3.3.3.4.2.1 BDP-Heavy ATV Waveform Transmission Processing

Specification 3.3.3.4.2.1.1 BDP-Heavy ATV Waveform Transmission Input Processing	
Text	The BDP-Heavy system shall decode and transform the data stream into three separate (Video Data Streams) digital representations (discrete-time analytic signals) of the analog audio, analog video luma, and analog video chroma signals; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case. 2. The inputs will supply the ATV Video Standard, RF carrier frequency, and modulation bandwidth information needed to produce the modulated RF waveform. 3. The audio stream will be converted into digital samples (discrete-time analytic signal) that represent the original monaural analog audio signal. 4. The .MPEG video stream will be converted to separate luma and chroma interlaced video signals made up of digital sample streams that represent (discrete-time analytic signals) the two analog video signals. 5. The luma/chroma signals are YIQ format for NTSC, YU'V for PAL, and YDbDr for both SECAM and PAL-N.

Specification 3.3.3.4.2.1.2 BDP-Heavy ATV Waveform Transmission Output Processing

Text	The BDP-Heavy system shall use the digital audio, luma, and chroma signal streams along with the control inputs to modulate the video luma signal on the RF carrier, the chroma signal on the color subcarrier, and the audio on the audio subcarrier that are combined into the video signal that is then converted to an analog signal creating the RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 15 dBm. 2. The average modulated RF output power level will be estimated for use internally during the ATV Waveform VSWR Processing.

3.3.3.4.2.2 BDP-Heavy ATV Waveform VSWR Processing

Specification 3.3.3.4.2.2.1 BDP-Heavy ATV Waveform VSWR Input Processing	
Text	The BDP-Heavy system shall calculate the Average Reflected Power from the ATV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case. 2. The inputs will supply the RF carrier frequency, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input.

Specification 3.3.3.4.2.2.2 BDP-Heavy ATV Waveform VSWR Output Processing

Text	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none">1. This processing is enabled when the input selects the sub-mode, Analog Television (ATV) in this case.2. The inputs will supply the RF carrier frequency, modulation method, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input.3. Low reflected power or high VSWR measurements will cause the RF Broadcast Pre-Amp Data Output to turn off and an error indication sent to the Waveform Control Outputs.

3.3.3.5 Digital TV Waveform Processing

The Smart-Silvia-Sys DTV Waveform Processing DTV capability is divided into the following specification groups:

Transmission processing provides the DTV broadcast transmission waveform processing capability.

VSWR processing provides the DTV broadcast VSWR processing capability.

An overview of the processing performed by these groups is shown in Figure ??.



Figure 8: DTV Waveform Processing Overview

3.3.3.5.1 BDP-Medium DTV Waveform Processing

3.3.3.5.1.1 BDP-Medium DTV Waveform Transmission Processing

Specification 3.3.3.5.1.1.1 BDP-Medium DTV Waveform Transmission Input Processing	
Text	The BDP-Medium system shall receive the data stream and output it as the Video Data Stream; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case, with a supported DTV Video Standard.

Specification 3.3.3.5.1.1.2 BDP-Medium DTV Waveform Transmission Output Processing

Text	The BDP-Medium system shall randomize, encode, and interleave the data from the Video Data Stream; group the bits into symbols and modulate on the RF carrier using the appropriate method dictated by the DTV Video Standard; then convert to an analog signal creating the RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 20 dBm. 2. The modulation method 8VSB or COFDM with PSK, QPSK, QAM, 16QAM, or 64QAM is controlled by the selected DTV Video Standard. 3. The average modulated RF output power level will be estimated for use internally during the DTV Waveform VSWR Processing.

3.3.3.5.1.2 BDP-Medium DTV Waveform VSWR Processing

Specification 3.3.3.5.1.2.1 BDP-Medium DTV Waveform VSWR Input Processing	
Text	The BDP-Medium system shall calculate the Average Reflected Power from the DTV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case. 2. The inputs will supply the RF carrier frequency, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input.

Specification 3.3.3.5.1.2.2 BDP-Medium DTV Waveform VSWR Output Processing

Text	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case. 2. The inputs will supply the RF carrier frequency, modulation method, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input. 3. Low reflected power or high VSWR measurements will cause the RF Broadcast Pre-Amp Data Output to turn off and an error indication sent to the Waveform Control Outputs.

3.3.3.5.2 BDP-Heavy DTV Waveform Processing

3.3.3.5.2.1 BDP-Heavy DTV Waveform Transmission Processing

Specification 3.3.3.5.2.1.1 BDP-Heavy DTV Waveform Transmission Input Processing	
Text	The BDP-Heavy system shall receive the data stream and output it as the Video Data Stream; all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case, with a supported DTV Video Standard.

Specification 3.3.3.5.2.1.2 BDP-Heavy DTV Waveform Transmission Output Processing

Text	The BDP-Heavy system shall randomize, encode, and interleave the data from the Video Data Stream; group the bits into symbols and modulate on the RF carrier using the appropriate method dictated by the DTV Video Standard; then convert to an analog signal creating the RF Broadcast Pre-Amp Data Output.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. The RF Broadcast Pre-Amp Data Output signal will have an unmodulated carrier output power level of 20 dBm. 2. The modulation method 8VSB or COFDM with PSK, QPSK, QAM, 16QAM, or 64QAM is controlled by the selected DTV Video Standard. 3. The average modulated RF output power level will be estimated for use internally during the DTV Waveform VSWR Processing.

3.3.3.5.2.2 BDP-Heavy DTV Waveform VSWR Processing

Specification 3.3.3.5.2.2.1 BDP-Heavy DTV Waveform VSWR Input Processing	
Text	The BDP-Heavy system shall calculate the Average Reflected Power from the DTV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case. 2. The inputs will supply the RF carrier frequency, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input.

Specification 3.3.3.5.2.2.2 BDP-Heavy DTV Waveform VSWR Output Processing

Text	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	<ol style="list-style-type: none"> 1. This processing is enabled when the input selects the sub-mode, Digital Television (DTV) in this case. 2. The inputs will supply the RF carrier frequency, modulation method, modulation bandwidth, and integration information needed to extract the reflected power from the Received RF Data Input. 3. Low reflected power or high VSWR measurements will cause the RF Broadcast Pre-Amp Data Output to turn off and an error indication sent to the Waveform Control Outputs.

3.3.4 RF Processing

The multi-channel, maximum broadcasting range, and SWaP requirements vastly differ among the Smart-Silvia-Sys variants, necessitating unique RF processing to adequately produce the radiated RF power that satisfies these requirements. For this reason, the Smart-Silvia-Sys RF Processing capability is segmented into the following specification groups:

BDP-Light RF Processing, § ??.

Under each of these segments the Smart-Silvia-Sys RF Processing capabilities are further subdivided into the supported broadcasting bands as needed:

AM provides the AM broadcast output and related RF processing.

SW provides the SW broadcast output and related RF processing.

FM provides the FM broadcast output and related RF processing.

VHF-L provides the VHF-L broadcast output and related RF processing.

VHF-H provides the VHF-H broadcast output and related RF processing.

TV UHF provides the TV UHF broadcast output and related RF processing.

3.3.4.1 BDP-Light RF Processing

3.3.4.1.1 BDP-Light FM RF Processing

The BDP-Light RF Processing FM capability is divided into two segments:

FM RF Transmission Processing provides the FM broadcast output capability.

FM RF Receive Processing provides the FM broadcast input capability required for the Rebroadcasting capability.

3.3.4.1.1.1 BDP-Light FM RF Transmission Processing

An overview the FM RF transmission processing performed is shown in Figure ??.



Figure 9: BDP-Light FM RF Transmission Processing Overview

Specification 3.3.4.1.1.1.1 BDP-Light FM RF Transmission Processing

Text	<p>The BDP-Light system shall filter, amplify, and radiate the FM RF Broadcast Pre-Amp Data along with producing an RF signal that is representative of the reflected RF power. The BDP-Light FM RF Transmission Processing capability shall have the following properties:</p> <ol style="list-style-type: none">1. The FM RF Broadcast Pre-Amp Data signal will have an average output power level of -12 dBm per RF carrier.2. The Band-Pass Filters () will filter out signals outside of the commercial FM broadcasting band of 87 - 108 MHz.3. The RF Power Amplifier (PA) will amplify the FM bandwidth input signal(s) by 50dB and have at least 25 W maximum output power. These power levels will support 4 simultaneous FM broadcasts (FM stations) at the maximum 5-mile range.4. The Low-Pass Filter () will filter out the generated harmonics above 108 MHz.5. The Directional Coupler (DC) will pass the RF signal to the antenna while siphoning off a portion (-30 to -50 dB) of the reflected power.6. The Antenna will radiate the RF signal(s) in the FM band and satisfy the range requirement using an omnidirectional dipole antenna. The antenna will have a VSWR less than 1.8 over the FM band, be capable of handling 25 W, and need to be mounted with a Height Above Average Terrain () of at least 20 feet.7. The attenuator is needed to protect the receiver from being over-driven by the reflected power. The value is dependent on the maximum PA output power and coupling factor of the DC. The attenuator will limit the signal to 0 dBm.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.3.4.1.1.2 BDP-Light FM RF Receive Processing

An overview the FM RF receive processing performed is shown in Figure ??.



../zProjectWideData/images/RFProcessing_Light_FM_Receive_300dpi_6500millWide-eps-conver

Figure 10: BDP-Light FM RF Receive Processing Overview

Specification 3.3.4.1.1.2.1 BDP-Light FM RF Receive Processing	
Text	<p>The BDP-Light system shall receive externally radiated RF signals, filter for the commercial FM broadcasting band, and amplify. The BDP-Light FM Receive Processing capability shall have the following properties:</p> <ol style="list-style-type: none">1. The Band-Pass Filter () will filter out signals outside of the commercial FM broadcasting band of 87 - 108 MHz.2. The Low-Noise Amplifier (LNA) will amplify the FM bandwidth input signal(s) by greater than 40dB with a Noise Figure less than 2 dB and a maximum output power less than 0 dBm.3. The Antenna will receive the radiated RF signals in the FM band and should be a directional antenna for maximum performance. The antenna is dependent on the location of the transmitter, but higher is better to reduce signal fading.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref'BDP'FOS'CDD]. 5.5.5 Section in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

3.3.4.1.2 BDP-Light TV RF Processing

The RF Transmission Processing does not distinguish between ATV and DTV RF signals, however, due to the wide range of the frequency bands, processing is segmented into the following transmission bands:

VHF-L provides the VHF-L broadcast output and related RF processing.

VHF-H provides the VHF-H broadcast output and related RF processing.

TV UHF provides the TV UHF broadcast output and related RF processing.

An overview the processing performed by these groups is shown in Figure ??.



../zProjectWideData/images/RFProcessing_Light_TV_Transmission_300dpi_6500millWide-eps-c

Figure 11: BDP-Light TV RF Transmission Processing Overview

3.3.4.1.2.1 BDP-Light VHF-L RF Transmission Processing

Specification 3.3.4.1.2.1.1 BDP-Light VHF-L RF Transmission Processing	
Text	<p>The BDP-Light system shall filter, amplify, and radiate the VHF-L RF Broadcast Pre-Amp Data along with producing an RF signal that is representative of the reflected RF power. The BDP-Light VHF-L RF Transmission Processing capability shall have the following properties:</p> <ol style="list-style-type: none"> 1. The TV RF Broadcast Pre-Amp Data signal will have an average output power level of -15 dBm per RF channel. 2. The Band-Pass Filters () will filter out signals outside of the commercial FM broadcasting band of 40 - 100 MHz. 3. The RF Power Amplifier (PA) will amplify the VHF-L bandwidth input signal(s) by 60dB and have at least 25 W maximum output power. These power levels will support a single TV broadcast (TV station) at the maximum 8-mile range. 4. The Low-Pass Filter () will filter out the generated harmonics above 100 MHz. 5. The Directional Coupler (DC) will pass the RF signal to the antenna while siphoning off a portion (-30 to -50 dB) of the reflected power. 6. The Antenna will radiate the RF signal(s) in the VHF-L band and satisfy the range requirement using an omnidirectional dipole antenna. The antenna will have a VSWR less than 1.8 over the VHF-L band, be capable of handling the PA output power, and need to be mounted with a Height Above Average Terrain () of at least 35 feet. 7. The attenuator is needed to protect the receiver from being over-driven by the reflected power. The value is dependent on the maximum PA output power and coupling factor of the DC. The attenuator will limit the signal to 0 dBm.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	<p>5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.1.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p>
Notes	1. N/A

3.3.4.1.2.2 BDP-Light VHF-H RF Transmission Processing

Specification 3.3.4.1.2.2.1 BDP-Light VHF-H RF Transmission Processing	
Text	<p>The BDP-Light system shall filter, amplify, and radiate the VHF-H RF Broadcast Pre-Amp Data along with producing an RF signal that is representative of the reflected RF power. The BDP-Light VHF-L RF Transmission Processing capability shall have the following properties:</p> <ol style="list-style-type: none"> 1. The TV RF Broadcast Pre-Amp Data signal will have an average output power level of -15 dBm per RF channel. 2. The Band-Pass Filters () will filter out signals outside of the commercial FM broadcasting band of 162 - 255 MHz. 3. The RF Power Amplifier (PA) will amplify the VHF-H bandwidth input signal(s) by 60dB and have at least 50 W maximum output power. These power levels will support a single TV broadcast (TV station) at the maximum 8-mile range. 4. The Low-Pass Filter () will filter out the generated harmonics above 255 MHz. 5. The Directional Coupler (DC) will pass the RF signal to the antenna while siphoning off a portion (-30 to -50 dB) of the reflected power. 6. The Antenna will radiate the RF signal(s) in the VHF-H band and satisfy the range requirement using an omnidirectional dipole antenna. The antenna will have a VSWR less than 1.8 over the VHF-H band, be capable of handling the PA output power, and need to be mounted with a Height Above Average Terrain () of at least 35 feet. 7. The attenuator is needed to protect the receiver from being overdriven by the reflected power. The value is dependent on the maximum PA output power and coupling factor of the DC. The attenuator will limit the signal to 0 dBm.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	<p>5.1.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.1.2 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.1.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.1 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.3 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p> <p>5.5.4 Section in CDD for BDP FoS [ref*BDP*FOS*CDD].</p>
Notes	1. N/A

3.3.4.1.2.3 BDP-Light TV UHF RF Transmission Processing

Specification 3.3.4.1.2.3.1 BDP-Light TV UHF RF Transmission Processing	
Text	<p>The BDP-Light system shall filter, amplify, and radiate the TV UHF RF Broadcast Pre-Amp Data along with producing an RF signal that is representative of the reflected RF power. The BDP-Light TV UHF RF Transmission Processing shall have the following properties:</p> <ol style="list-style-type: none"> 1. The TV RF Broadcast Pre-Amp Data signal will have an average output power level of -15 dBm per RF channel. 2. The Band-Pass Filters () will filter out signals outside of the commercial FM broadcasting band of 470 - 890 MHz. 3. The RF Power Amplifier (PA) will amplify the TV UHF bandwidth input signal(s) by 65dB and have at least 100 W maximum output power. These power levels will support a single TV broadcast (TV station) at the maximum 8-mile range. 4. The Low-Pass Filter () will filter out the generated harmonics above 890 MHz. 5. The Directional Coupler (DC) will pass the RF signal to the antenna while siphoning off a portion (-30 to -50 dB) of the reflected power. 6. The Antenna will radiate the RF signal(s) in the TV UHF band and satisfy the range requirement using an omnidirectional dipole antenna. The antenna will have a VSWR less than 1.8 over the TV UHF band, be capable of handling the PA output power, and need to be mounted with a Height Above Average Terrain () of at least 35 feet. 7. The attenuator is needed to protect the receiver from being over-driven by the reflected power. The value is dependent on the maximum PA output power and coupling factor of the DC. The attenuator will limit the signal to 0 dBm.
Status	Phase 1 Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	<p>5.1.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p> <p>5.1.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p> <p>5.1.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p> <p>5.5.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p> <p>5.5.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p> <p>5.5.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].</p>
Notes	1. N/A

3.3.5 Network Processing

The Smart-Silvia-Sys capability is segmented into the following specification groups:

Digital File Transfer describes the system ability to transfer files over the network, § ??.

3.3.5.1 Digital File Transfer

Specification 3.3.5.1.1 Digital Product Transfer	
Text	All BDP system variants shall be capable of digital product transfer with no file corruption.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

3.3.6 BIT

The Smart-Silvia-Sys capability meets the following specification groups:

BIT Processing describes the operational status of the the system following a self test, § ??.

BIT Log Reporting describes the logging and exporting of BIT logs, § ??.

3.3.6.1 BIT Processing

Specification 3.3.6.1.1 BIT Operational Status	
Text	All BDP system variants shall run a self-test at startup and include a visual indicator of its operational status.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.15.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

3.3.6.2 BIT Log Reporting

Specification 3.3.6.2.1 BIT Logs	
Text	All BDP system variants shall be able to store and export BIT logs in .txt and .csv formats.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.15.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A.

3.4 Internal Interface Requirements

SSS-3.4.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, IMPOSED ON INTERFACES INTERNAL TO THE SYSTEM. IF ALL INTERNAL INTERFACES ARE LEFT TO THE DESIGN OR TO REQUIREMENT SPECIFICATIONS FOR SYSTEM COMPONENTS, THIS FACT SHALL BE SO STATED.

This section provides the internal interface requirements. These requirements for these interfaces are described in more detail in the following sections:

Internal Interface Requirement One stuff

Internal Interface Requirement One more stuff

3.4.1 IIR One

This section is provided for future expansion.

3.4.2 IIR Two

This section is provided for future expansion.

3.5 Internal Data Requirements

SSS-3.5.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, IMPOSED ON DATA INTERNAL TO THE SYSTEM. INCLUDED SHALL BE REQUIREMENTS, IF ANY, ON DATABASES AND DATA FILES TO BE INCLUDED IN THE SYSTEM. IF ALL DECISIONS ABOUT INTERNAL DATA ARE LEFT TO THE DESIGN OR TO REQUIREMENTS SPECIFICATIONS FOR SYSTEM COMPONENTS, THIS FACT SHALL BE SO STATED.

This section provides the internal data requirements. The Smart-Silvia-Sys capability is segmented into the following specification groups:

Data Storage provides the data storage requirements, § ??.

Report Logs provides the report log requirement, § ??.

3.5.1 Data Storage

Specification 3.5.1.1 Data Storage	
Text	All BDP system variants shall store digital files received for transmission using 2 TB of internal storage.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.12.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.5.1.2 Information Transport	
Text	All BDP system variants shall be able to manually upload and download digital files using external SD card, CD, and DVD formats.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.12.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.5.2 Report Logs

Specification 3.5.2.1 Report Logs	
Text	The system shall locally store reports for up to 12 months and be capable of exporting in .txt, .csv, and .xml formats.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.15.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.20 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.21 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.22 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. Where does this information come from? ...TBD....

3.6 Adaptation Requirements

SSS-3.6.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, CONCERNING INSTALLATION-DEPENDENT DATA THAT THE SYSTEM IS REQUIRED TO PROVIDE (SUCH AS SITE DEPENDENT LATITUDE AND LONGITUDE OR SITE-DEPENDENT STATE TAX CODES) AND OPERATIONAL PARAMETERS THAT THE SYSTEM IS REQUIRED TO USE THAT MAY VARY ACCORDING TO OPERATIONAL NEEDS (SUCH AS PARAMETERS INDICATING OPERATION-DEPENDENT TARGETING CONSTANTS OR DATA RECORDING).

This section is provided for future expansion.

3.7 Safety Requirements

SSS-3.7.0 :: THIS SECTION SHALL SPECIFY THE SYSTEM REQUIREMENTS, IF ANY, CONCERNED WITH PREVENTING OR MINIMIZING UNINTENDED HAZARDS TO PERSONNEL, PROPERTY, AND THE PHYSICAL ENVIRONMENT. EXAMPLES INCLUDE RESTRICTING THE USE OF DANGEROUS MATERIALS; CLASSIFYING EXPLOSIVES FOR PURPOSES OF SHIPPING, HANDLING, AND STORING; ABORT/ESCAPE PROVISIONS FROM ENCLOSURES; GAS DETECTION AND WARNING DEVICES; GROUNDING OF ELECTRICAL SYSTEMS; DECONTAMINATION; AND EXPLOSION PROOFING. THIS PARAGRAPH SHALL INCLUDE THE SYSTEM REQUIREMENTS, IF ANY, FOR NUCLEAR COMPONENTS, INCLUDING, AS APPLICABLE, REQUIREMENTS FOR COMPONENT DESIGN, PREVENTION OF INADVERTENT DETONATION, AND COMPLIANCE WITH NUCLEAR SAFETY RULES.

This section lists the safety requirements for the system. The Smart-Silvia-Sys capability is segmented into the following specification groups:

Electromagnetic Radiation describes the safety requirements pertaining to the presence of , § ??.

3.7.1 Electromagnetic Radiation

Specification 3.7.1.1 EMR Hazards	
Text	Hazards of Electromagnetic Radiation to Ordnance (HERO) and Hazards of Electromagnetic Radiation to Fuel (HERF) are not applicable to Smart-Silvia-Sys. There is no Hazard of Electromagnetic Radiation to Personnel (HERP) when Smart-Silvia-Sys is properly installed and operated.
Status	T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	8.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.7.1.2 EMR Safety	
Text	We shall identify, evaluate, assess, and mitigate any safety, health, or ergonomic hazards associated with the use, transport, maintenance, storage, and handling of Smart-Silvia-Sys.
Status	T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	8.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.8 Security and Privacy Requirements

SSS-3.8.0 :: THIS SECTION SHALL SPECIFY THE SYSTEM REQUIREMENTS, IF ANY, CONCERNED WITH MAINTAINING SECURITY AND PRIVACY. THE REQUIREMENTS SHALL INCLUDE, AS APPLICABLE, THE SECURITY/PRIVACY ENVIRONMENT IN WHICH THE SYSTEM MUST OPERATE, THE TYPE AND DEGREE OF SECURITY OR PRIVACY TO BE PROVIDED, THE SECURITY/PRIVACY RISKS THE SYSTEM MUST WITHSTAND, REQUIRED SAFEGUARDS TO REDUCE THOSE RISKS, THE SECURITY/PRIVACY POLICY THAT MUST BE MET, THE SECURITY/PRIVACY ACCOUNTABILITY THE SYSTEM MUST PROVIDE, AND THE CRITERIA THAT MUST BE MET FOR SECURITY/PRIVACY CERTIFICATION/ACCREDITATION.

This section provides the security and privacy requirements for Smart-Silvia-Sys. The Smart-Silvia-Sys capability is segmented into the following specification groups:

Security Requirements provides the physical and cyber security requirements of the system, § ??.

3.8.1 Security Requirements

3.8.1.1 Physical Security

Specification 3.8.1.1.1 Anti-Tamper	
Text	The BDP FoS shall deter all unauthorized alterations, countermeasure development, and system exploitation.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	6.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.8.1.2 Cyber Security

This section is provided for future expansion.

3.8.1.3 Use of Prohibited Telecommunications Equipment

Specification 3.8.1.3.1 Prohibited Telecom Conformity	
Text	All BDP systems shall comply with National Defense Authorization Act (NDAA) Section 889 Part B.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	This requirement is a base requirement.
Notes	1. Telecommunications or video surveillance equipment or services produced or provided by any of these companies: Dahua Technology Company, Hangzhou Hikvision Digital Technology Company, Huawei Technologies Company, Hytera Communications Corporation, ZTE Corporation.

3.8.2 Privacy Requirements

This section is provided for future expansion.

3.9 Environmental Requirements

SSS-3.9.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, REGARDING THE ENVIRONMENT IN WHICH THE SYSTEM MUST OPERATE. EXAMPLES FOR A SOFTWARE SYSTEM ARE THE COMPUTER HARDWARE AND OPERATING SYSTEM ON WHICH THE SOFTWARE MUST RUN. (ADDITIONAL REQUIREMENTS CONCERNING COMPUTER RESOURCES ARE GIVEN IN THE NEXT PARAGRAPH). EXAMPLES FOR A HARDWARE-SOFTWARE SYSTEM INCLUDE THE ENVIRONMENTAL CONDITIONS THAT THE SYSTEM MUST WITHSTAND DURING TRANSPORTATION, STORAGE, AND OPERATION, SUCH AS CONDITIONS IN THE NATURAL ENVIRONMENT (WIND, RAIN, TEMPERATURE, GEOGRAPHIC LOCATION), THE INDUCED ENVIRONMENT (MOTION, SHOCK, NOISE, ELECTROMAGNETIC RADIATION), AND ENVIRONMENTS DUE TO ENEMY ACTION (EXPLOSIONS, RADIATION).

This section defines the environmental requirements for Smart-Silvia-Sys.

3.9.1 Temperature

Specification 3.9.1.1 Temperature	
Text	All BDP system variants shall be tested to meet applicable environmental standards as outlined in Military Standard 810G (MIL-STD-810G).
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	6.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.2 Moisture

This section is provided for future expansion.

3.9.3 Dust

This section is provided for future expansion.

3.9.4 Shock

Specification 3.9.4.1 Transit Drop Shock	
Text	All BDP system variants shall withstand the effects of shock (Transit Drop) per Military Standard 810H (MIL-STD-810H), Method 516.6, Procedure IV.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	6.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.5 Vibration

Specification 3.9.5.1 Vibration	
Text	All BDP system variants shall withstand the effects of vibration (General) per Military Standard 810H (MIL-STD-810H), Method 514.6, Procedures I and III.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	6.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.6 Space**3.9.6.1 BDP-Light Space**

Specification 3.9.6.1.1 Space	
Text	The BDP-Light system shall be modular and packaged for transport into 2 ruggedized cases.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.8 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.6.2 BDP-Medium Space

Specification 3.9.6.2.1 Space	
Text	The BDP-Medium system shall be modular and packaged for transport into 10 ruggedized cases.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.8 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.7 Weight**3.9.7.1 BDP-Light Weight**

Specification 3.9.7.1.1 System Weight	
Text	The complete BDP-Light system shall weigh no more than 100 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.9.7.1.2 Core Weight

Text	The BDP-Light core system shall weigh no more than 10 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.7.2 BDP-Medium Weight**Specification 3.9.7.2.1 System Weight**

Text	The complete BDP-Medium system shall weigh no more than 500 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.9.7.2.2 Core Weight

Text	The BDP-Medium core system shall weigh no more than 65 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.7.3 BDP-Heavy Weight**Specification 3.9.7.3.1 System Weight**

Text	The complete BDP-Heavy system shall weigh no more than 2000 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.9.7.3.2 Core Weight

Text	The BDP-Heavy core system shall weigh no more than 65 pounds.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	5.5.6.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.8 Power**3.9.8.1 BDP-Light Power****Specification 3.9.8.1.1 Internal Power**

Text	The BDP-Light system shall be capable of operating on an internal military standard radio battery.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.10.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

Specification 3.9.8.1.2 External Power

Text	The BDP-Light system shall be able to connect to external 120/240 VAC, 50/60 Hz power.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.8.2 BDP-Medium Power

Specification 3.9.8.2.1 External Power	
Text	The BDP-Medium system shall be capable of connecting to a 3 kW generator producing 120/240 VAC, 50/60 Hz power.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.8.3 BDP-Heavy Power

Specification 3.9.8.3.1 External Power	
Text	The BDP-Heavy system shall be capable of connecting to a 10 kW generator producing 120/240 VAC, 50/60 Hz power.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.9 Section in CDD for BDP FoS [ref`BDP`FOS`CDD]. 5.5.10.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.9 Electromagnetic

Specification 3.9.9.1 Electromagnetic Effects	
Text	All BDP system variants will conform to the electromagnetic environmental effects requirements as documented in DOD Directive 3222.3.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by testing.
Traceability	8.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.9.10 Altitude

This section is provided for future expansion.

3.10 Technology Resource Requirements

SSS-3.10.0 :: THIS SECTION SHALL BE DIVIDED INTO THE FOLLOWING SUBSECTIONS. DEPENDING UPON THE NATURE OF THE SYSTEM, THE COMPUTER RESOURCES COVERED IN THESE SUBSECTIONS MAY CONSTITUTE THE ENVIRONMENT OF THE SYSTEM (AS FOR A SOFTWARE SYSTEM) OR COMPONENTS OF THE SYSTEM (AS FOR A HARDWARE-SOFTWARE SYSTEM).

This section provides the overall technology resource requirements for the system. These capabilities are divided into the following sections:

Hardware details about the hardware to be used.

Software details about the software to be used.

Communications details about the communications to be used.

Other details about other technology resource requirements not covered above.

Utilization details about the resource utilization.

3.10.1 Hardware Resources

THIS PARAGRAPH SHALL SPECIFY THE REQUIREMENTS, IF ANY, REGARDING COMPUTER HARDWARE THAT MUST BE USED BY, OR INCORPORATED INTO, THE SYSTEM. THE REQUIREMENTS SHALL INCLUDE, AS APPLICABLE, NUMBER OF EACH TYPE OF EQUIPMENT, TYPE, SIZE, CAPACITY, AND OTHER REQUIRED CHARACTERISTICS OF PROCESSORS, MEMORY, INPUT/OUTPUT DEVICES, AUXILIARY STORAGE, COMMUNICATIONS/NETWORK EQUIPMENT, AND OTHER REQUIRED EQUIPMENT.

This section provides the system computer hardware requirements.

3.10.2 Software Resources

THIS PARAGRAPH SHALL SPECIFY THE REQUIREMENTS, IF ANY, REGARDING SOFTWARE THAT MUST BE USED BY, OR INCORPORATED INTO, THE SYSTEM. EXAMPLES INCLUDE OPERATING SYSTEMS, DATABASE MANAGEMENT SYSTEMS, COMMUNICATIONS/NETWORK SOFTWARE, UTILITY SOFTWARE, INPUT AND EQUIPMENT SIMULATORS, TEST SOFTWARE, AND MANUFACTURING SOFTWARE. THE CORRECT NOMENCLATURE, VERSION, AND DOCUMENTATION REFERENCES OF EACH SUCH SOFTWARE ITEM SHALL BE PROVIDED.

This section provides the system software requirements

3.10.3 Communications Resources

THIS PARAGRAPH SHALL SPECIFY THE REQUIREMENTS, IF ANY, REGARDING COMPUTER HARDWARE THAT MUST BE USED BY, OR INCORPORATED INTO, THE SYSTEM. THE REQUIREMENTS SHALL INCLUDE, AS APPLICABLE, NUMBER OF EACH TYPE OF EQUIPMENT, TYPE, SIZE, CAPACITY, AND OTHER REQUIRED CHARACTERISTICS OF PROCESSORS, MEMORY, INPUT/OUTPUT DEVICES, AUXILIARY STORAGE, COMMUNICATIONS/NETWORK EQUIPMENT, AND OTHER REQUIRED EQUIPMENT.

This section defines the computer communications requirements.

3.10.4 Other Resources

THIS PARAGRAPH SHALL SPECIFY THE REQUIREMENTS, IF ANY, REGARDING OTHER TECHNOLOGY THAT MUST BE USED BY, OR INCORPORATED INTO, THE SYSTEM. THIS INCLUDES ITEMS SUCH AS OPERATOR DISPLAYS, SECURITY DEVICES, ETC.

This section is provided for future expansion.

3.10.5 Utilization Resources

THIS PARAGRAPH SHALL SPECIFY THE REQUIREMENTS, IF ANY, ON THE SYSTEM'S COMPUTER HARDWARE RESOURCE UTILIZATION, SUCH AS MAXIMUM ALLOWABLE USE OF PROCESSOR CAPACITY, MEMORY CAPACITY, INPUT/OUTPUT DEVICE CAPACITY, AUXILIARY STORAGE DEVICE CAPACITY, AND COMMUNICATIONS/NETWORK EQUIPMENT CAPACITY. THE REQUIREMENTS (STATED, FOR EXAMPLE, AS PERCENTAGES OF THE CAPACITY OF EACH COMPUTER HARDWARE RESOURCE) SHALL INCLUDE THE CONDITIONS, IF ANY, UNDER WHICH THE RESOURCE UTILIZATION IS TO BE MEASURED.

This section provides the system technology resource utilization requirements. Specific requirements are presented for hardware, software, communications, and other technology resources.

3.11 System Quality Requirements

SSS-3.11.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, PERTAINING TO SYSTEM QUALITY FACTORS. EXAMPLES INCLUDE QUANTITATIVE REQUIREMENTS CONCERNING SYSTEM FUNCTIONALITY (THE ABILITY TO PERFORM ALL REQUIRED FUNCTIONS), RELIABILITY (THE ABILITY TO PERFORM WITH CORRECT, CONSISTENT RESULTS – SUCH AS MEAN TIME BETWEEN FAILURE FOR EQUIPMENT), MAINTAINABILITY (THE ABILITY TO BE EASILY SERVICED, REPAIRED, OR CORRECTED), AVAILABILITY (THE ABILITY TO BE ACCESSED AND OPERATED WHEN NEEDED), FLEXIBILITY (THE ABILITY TO BE EASILY ADAPTED TO CHANGING REQUIREMENTS), PORTABILITY OF SOFTWARE (THE ABILITY TO BE EASILY MODIFIED FOR A NEW ENVIRONMENT), REUSABILITY (THE ABILITY TO BE USED IN MULTIPLE APPLICATIONS), TESTABILITY (THE ABILITY TO BE EASILY AND THOROUGHLY TESTED), USABILITY (THE ABILITY TO BE EASILY LEARNED AND USED), AND OTHER ATTRIBUTES.

This section specifies the Smart-Silvia-Sys quality requirements.

3.11.1 Quality Systems

Specification 3.11.1.1 Development Quality	
Text	The system design and development shall follow the implementers' certified processes.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.

3.11.2 Operational Quality**3.11.2.1 BDP-Light**

Specification 3.11.2.1.1 BDP-Light Duty Cycle	
Text	The BDP-Light system shall be capable of continuously transmitting for 8 hours per day for 30 consecutive days.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.14.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The implication of this requirement is that the system software will function non-stop. Thus, this is a requirement on the overall software design and construction quality, not the underlying hardware quality.

3.11.2.2 BDP-Medium

Specification 3.11.2.2.1 BDP-Medium Duty Cycle	
Text	The BDP-Medium system shall be capable of continuously transmitting for 18 hours per day for 30 consecutive days.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.14.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The implication of this requirement is that the system software will function non-stop. Thus, this is a requirement on the overall software design and construction quality, not the underlying hardware quality.

3.11.2.3 BDP-Heavy

Specification 3.11.2.3.1 BDP-Heavy Duty Cycle	
Text	The BDP-Heavy system shall be capable of continuously transmitting for 18 hours per day for 30 consecutive days.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.14.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. The implication of this requirement is that the system software will function non-stop. Thus, this is a requirement on the overall software design and construction quality, not the underlying hardware quality.

3.12 Design and Construction Requirements

SSS-3.12.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, THAT CONSTRAIN THE DESIGN AND CONSTRUCTION OF THE SYSTEM. FOR HARDWARE-SOFTWARE SYSTEMS, THIS PARAGRAPH SHALL INCLUDE THE PHYSICAL REQUIREMENTS IMPOSED ON THE SYSTEM. THESE REQUIREMENTS MAY BE SPECIFIED BY REFERENCE TO APPROPRIATE COMMERCIAL OR MILITARY STANDARDS AND SPECIFICATIONS.

This section provides the Smart-Silvia-Sys design and construction requirements.

3.12.1 Regulatory Restrictions

This section is included for future expansion.

Specification 3.12.1.2 Proprietary Components	
Text	All BDP system variants shall include only software components that are open source or to which the U.S. Government has unlimited rights.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.
Notes	1. The inspection is of the software design documents and build scripts to ensure that all code meets this requirement.

3.12.2 Design Defences

3.12.2.1 System Set-Up Time

3.12.2.1.1 BDP-Heavy

Specification 3.12.2.1.1.1 BDP-Heavy System Set-Up	
Text	The BDP-Heavy system shall be capable of being set up in one (1) hour with five (5) soldiers.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.16.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.1.2 BDP-Medium

Specification 3.12.2.1.2.1 BDP-Medium System Set-Up	
Text	The BDP-Medium system shall be capable of being set up in one (1) hour with five (5) soldiers.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.16.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.1.3 BDP-Light

Specification 3.12.2.1.3.1 BDP-Light System Set-Up	
Text	The BDP-Light system shall be capable of being set up in thirty (30) minutes with three (3) soldiers.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.16.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.2 Mast and Antenna Employment**3.12.2.2.1 BDP-Heavy**

Specification 3.12.2.2.1.1 BDP-Heavy Mast and Antenna Employment	
Text	The BDP-Heavy system shall be erectable by a five (5) person team.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.17.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.2.2 BDP-Medium

Specification 3.12.2.2.1 BDP-Medium Mast and Antenna Employment	
Text	The BDP-Medium system shall be erectable by a five (5) person team.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.17.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.2.3 BDP-Light

Specification 3.12.2.2.3.1 BDP-Light Mast and Antenna Employment	
Text	The BDP-Light system shall be erectable by a three (3) person team.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.17.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.3 Antenna Height Extension

Specification 3.12.2.3.1 Antenna Extension	
Text	The Smart-Silvia-Sys shall use an antenna to increase broadcast range.
Status	Tethered (wired) Antenna Threshold Drone (wireless) Objective
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.6.2 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.2.4 System Supportability

Specification 3.12.2.4.1 Maintenance	
Text	The Smart-Silvia-Sys maintenance process shall include a two-level maintenance concept.
Status	T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	12.4 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.12.3 Construction Constraints

This section provides the construction constraints.

This section is provided for future expansion.

3.13 Personnel Requirements

SSS-3.13.0 :: THIS SECTION SHALL SPECIFY THE SYSTEM REQUIREMENTS, IF ANY, INCLUDED TO ACCOMMODATE THE NUMBER, SKILL LEVELS, DUTY CYCLES, TRAINING NEEDS, OR OTHER INFORMATION ABOUT THE PERSONNEL WHO WILL USE OR SUPPORT THE SYSTEM. EXAMPLES INCLUDE REQUIREMENTS FOR THE NUMBER OF WORK STATIONS TO BE PROVIDED AND FOR BUILT-IN HELP AND TRAINING FEATURES. ALSO INCLUDED SHALL BE THE HUMAN FACTORS ENGINEERING REQUIREMENTS, IF ANY, IMPOSED ON THE SYSTEM. THESE REQUIREMENTS SHALL INCLUDE, AS APPLICABLE, CONSIDERATIONS FOR THE CAPABILITIES AND LIMITATIONS OF HUMANS, FORESEEABLE HUMAN ERRORS UNDER BOTH NORMAL AND EXTREME CONDITIONS, AND SPECIFIC AREAS WHERE THE EFFECTS OF HUMAN ERROR WOULD BE PARTICULARLY SERIOUS. EXAMPLES INCLUDE REQUIREMENTS FOR ADJUSTABLE-HEIGHT WORK STATIONS, COLOR AND DURATION OF ERROR MESSAGES, PHYSICAL PLACEMENT OF CRITICAL INDICATORS OR BUTTONS, AND USE OF AUDITORY SIGNALS.

This section is provided for future expansion.

3.14 Training Requirements

SSS-3.14.0 :: THIS SECTION SHALL SPECIFY THE SYSTEM REQUIREMENTS, IF ANY, PERTAINING TO TRAINING. EXAMPLES INCLUDE TRAINING DEVICES AND TRAINING MATERIALS TO BE INCLUDED IN THE SYSTEM.

3.14.1 Manuals

Specification 3.14.1.1 Operator's Guide	
Text	The Smart-Silvia-Sys training shall provide an operator's manual.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	12.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.14.2 Materials

Specification 3.14.2.1 Training Materials	
Text	The Smart-Silvia-Sys training shall provide all training course materials.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by inspection.
Traceability	12.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.14.3 Courses

Specification 3.14.3.1 Training Courses	
Text	The vendor will provide specific training and course materials and programs of instruction.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	12.3 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.15 Logistics Requirements

SSS-3.15.0 :: THIS SECTION SHALL SPECIFY THE SYSTEM REQUIREMENTS, IF ANY, CONCERNED WITH LOGISTICS CONSIDERATIONS. THESE CONSIDERATIONS MAY INCLUDE: SYSTEM MAINTENANCE, SOFTWARE SUPPORT, SYSTEM TRANSPORTATION MODES, SUPPLY-SYSTEM REQUIREMENTS, IMPACT ON EXISTING FACILITIES, AND IMPACT ON EXISTING EQUIPMENT.

3.15.1 Transportability

Specification 3.15.1.1 Transportability	
Text	All BDP system variants shall be transportable by air, ground, and maritime resources.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.7.1 Section in CDD for BDP FoS [ref`BDP`FOS`CDD].
Notes	1. N/A

3.15.1.1 BDP-Light

Specification 3.15.1.1.1 BDP-Light Transit Cases	
Text	The BDP-Light system shall be configured in ruggedized transit cases, not to exceed 2-man lift in accordance with Military Standard 1472G (MIL-STD-1472G) and meet commercial airline size and dimension requirements for checked baggage (Domestic and International travel).
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.7.2 Section in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

3.15.1.2 BDP-Medium

Specification 3.15.1.2.1 BDP-Medium Transit Cases	
Text	The BDP-Medium system shall be configured in ruggedized transit cases, not to exceed 2-man lift in accordance with Military Standard 1472G (MIL-STD-1472G) and meet commercial airline size and dimension requirements for checked baggage (Domestic and International travel).
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.7.2 Section in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

3.16 Packaging Requirements

SSS-3.16.0 :: THIS SECTION SHALL SPECIFY THE REQUIREMENTS, IF ANY, FOR PACKAGING, LABELING, AND HANDLING THE SYSTEM AND ITS COMPONENTS FOR DELIVERY. APPLICABLE MILITARY SPECIFICATIONS AND STANDARDS MAY BE REFERENCED IF APPROPRIATE.

3.16.1 Shipping Constraints

This section is provided for future expansion.

3.17 Other Requirements

SSS-3.17.0 :: THIS PARAGRAPH SHALL SPECIFY ADDITIONAL SYSTEM REQUIREMENTS, IF ANY, NOT COVERED IN THE PREVIOUS PARAGRAPHS. EXAMPLES INCLUDE REQUIREMENTS FOR SYSTEM DOCUMENTATION, SUCH AS SPECIFICATIONS, DRAWINGS, TECHNICAL MANUALS, TEST PLANS AND PROCEDURES, AND INSTALLATION INSTRUCTION DATA, IF NOT COVERED IN OTHER CONTRACTUAL DOCUMENTS.

3.17.1 Broadcast Playlist Manager

Specification 3.17.1.1 Playlist Manager	
Text	All BDP system variants shall interface with an approved external broadcast playlist manager that will provide the operator the ability to manage programming in real-time.
Status	Phase 1 T=O
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.11.1 Section in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

Specification 3.17.1.2 Playlist Length	
Text	All BDP system variants' playlists shall have continuous broadcast programming with a pause, resume, repeat, and schedule/timer functions, and a minimum time block of four (4) hours.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.5.11.2 Section in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

3.17.2 Information Exchange

Specification 3.17.2.1 IP Data	
Text	All BDP system variants shall be capable of disseminating data on an approved network with a reasonable response time of less than four (4) hours.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by demonstration.
Traceability	5.4 Table in CDD for BDP FoS [ref'BDP'FOS'CDD].
Notes	1. N/A

3.18 Precedence of Requirements

SSS-3.18.0 :: THIS SECTION SHALL SPECIFY, IF APPLICABLE, THE ORDER OF PRECEDENCE, CRITICALITY, OR ASSIGNED WEIGHTS INDICATING THE RELATIVE IMPORTANCE OF THE REQUIREMENTS IN THIS SPECIFICATION. EXAMPLES INCLUDE IDENTIFYING THOSE

REQUIREMENTS DEEMED CRITICAL TO SAFETY, TO SECURITY, OR TO PRIVACY FOR PURPOSES OF SINGLING THEM OUT FOR SPECIAL TREATMENT. IF ALL REQUIREMENTS HAVE EQUAL WEIGHT, THIS PARAGRAPH SHALL SO STATE.

3.18.1 Safety

Specification 3.18.1.1 Safety Requirements Precedence	
Text	All BDP system variants shall meet safety requirements listed in Section ?? before all other requirements.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.
Notes	<ol style="list-style-type: none"> 1. Obviously safety is of utmost importance. 2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

3.18.2 Security and Privacy

Specification 3.18.2.1 Security Requirements Precedence	
Text	All BDP system variants shall meet security requirements listed in Section ?? before all other requirements with the exception of safety.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.
Notes	<ol style="list-style-type: none"> 1. Security trumps privacy since good security should help ensure privacy. 2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

Specification 3.18.2.2 Privacy Requirements Precedence

Text	All BDP system variants shall meet privacy requirements listed in Section ?? before all other requirements with the exception of safety and security.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.
Notes	<ol style="list-style-type: none">1. Privacy is trumped by security since good security should help ensure privacy.2. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

3.18.3 Other**Specification 3.18.3.1 Other Requirements Precedence**

Text	All BDP system variants shall meet with equal precedence all other requirements not pertaining to safety, security, and privacy.
Status	Phase 1 Threshold
Acceptance	This requirement shall be verified by inspection.
Traceability	N/A This requirement is a base requirement.
Notes	<ol style="list-style-type: none">1. The inspection is of design notes and rationale whereby design decisions relating to precedence are recorded.

CHAPTER 4

Qualification Provisions

The qualification provisions are listed in the acceptance row of the specifications in Section 3.

CHAPTER 5**Traceability**

This section provides a list of the sources, if applicable, for each requirement. This traceability connects the specifications in this document to those presented in higher level sources such as a Joint Urgent Operational Need (JUON) document, Joint Emergent Operational Need (JEON), or a STATEMENT OF WORK (SOW)

The traceability of all specifications from each requirement to its source, if applicable, is listed in the specifications presented in section 3. Traceability from each document to requirements is provided below.

Table 6: Source to Requirement Traceability.

Source Requirement	Traced Requirement
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Source Requirement	Traced Requirement
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
3.2.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Source Requirement	Traced Requirement
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.4 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.1.5 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Source Requirement	Traced Requirement
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.3 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Table 6 – continued from previous page

Source Requirement	Traced Requirement
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10.1 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.10.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.11 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.11 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.11.1 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.11.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
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Table 6 – continued from previous page

Source Requirement	Traced Requirement
5.5.12 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.12 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.12.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.12.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.13 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.13 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.13 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.13 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.14 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.14.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.14.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.14.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.15 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.15 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.15.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.15.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.15.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.16.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.16.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.16.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Table 6 – continued from previous page

Source Requirement	Traced Requirement
5.5.17.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.17.1 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.17.2 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.18 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.18 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.18 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.18 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.19 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.19 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.20 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.20 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.20 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.20 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
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Table 6 – continued from previous page

Source Requirement	Traced Requirement
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.21 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.22 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.22 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.22 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.5.22 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
5.6.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
6.1 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
6.1 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
6.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
6.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
7.0 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
8.1 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
8.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
8.2 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
12.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
12.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
12.3 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
12.4 :: Section in CDD for BDP FoS [ref*BDP*FOS*CDD].	??
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Table 6 – continued from previous page

Source Requirement	Traced Requirement
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
5.4 :: Table in CDD for BDP FoS [ref`BDP`FOS`CDD].	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??
N/A :: This requirement is a base requirement.	??

APPENDIX

Notes

This section provides notes, as necessary, to document the system segmentation specification.

APPENDIX**Key Performance Parameters and System Attributes**

This Appendix provides the key performance parameters and key system attributes, summarized in a short list for easy review.

B.1 Key Performance Parameters

Table B.7: Key Performance Parameter Specifications

Specification	Key Performance Parameter
??	The BDP-Light system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
??	The BDP-Light system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
??	The BDP-Light system shall provide the FM Radio Broadcast Sub-Mode.
??	The BDP-Light system shall provide the FM Radio Broadcast with RDS/RBDS Sub-channel Sub-Mode.
??	The BDP-Light system shall provide the SMS Messaging Dissemination Sub-Mode.
??	The BDP-Medium system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
??	The BDP-Medium system shall provide the Television Broadcast Mode in the states and sub-states as shown in Table ??.
??	The BDP-Medium system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
??	The BDP-Medium system shall provide the SW Radio Broadcast Sub-Mode.
??	The BDP-Medium system shall provide the AM Radio Broadcast Sub-Mode.
??	The BDP-Medium system shall provide the FM Radio Broadcast Sub-Mode.
??	The BDP-Medium system shall provide the FM Radio Broadcast Sub-Mode with RDS text.
??	The BDP-Medium system shall provide the FM Radio Rebroadcast Sub-Mode.
??	The BDP-Medium system shall provide the Analog TV Sub-Mode.
Continued on next page	

Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall provide the Digital TV Sub-Mode.
??	The BDP-Medium system shall provide the SMS Messaging Dissemination Sub-Mode.
??	The BDP-Medium system shall provide the MMS Messaging Dissemination Sub-Mode.
??	The BDP-Medium system shall provide the CBS Messaging Dissemination Sub-Mode.
??	The BDP-Heavy system shall provide the Radio Broadcast Mode in the states and sub-states as shown in Table ??.
??	The BDP-Heavy system shall provide the Television Broadcast Mode in the states and sub-states as shown in Table ??.
??	The BDP-Heavy system shall provide the Cellular Dissemination Mode in the states and sub-states as shown in Table ??.
??	The BDP-Heavy system shall provide the SW Radio Broadcast Sub-Mode.
??	The BDP-Heavy system shall provide the AM Radio Broadcast Sub-Mode.
??	The BDP-Heavy system shall provide the FM Radio Broadcast Sub-Mode.
??	The BDP-Heavy system shall provide the FM Radio Broadcast Sub-Mode with RDS text.
??	The BDP-Heavy system shall provide the FM Radio Rebroadcast Sub-Mode.
??	The BDP-Heavy system shall provide the Analog TV Sub-Mode.
??	The BDP-Heavy system shall provide the Digital TV Sub-Mode.
??	The BDP-Heavy system shall provide the SMS Messaging Dissemination Sub-Mode.
??	The BDP-Heavy system shall provide the MMS Messaging Dissemination Sub-Mode.
??	The BDP-Heavy system shall provide the CBS Messaging Dissemination Sub-Mode.
??	All BDP system variants shall be capable of connecting to an approved network.
??	The BDP-Medium system shall deliver an AM transmission to an audience in all directions from the transmitting source.
Continued on next page	

Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Heavy system shall deliver an AM transmission to an audience in all directions from the transmitting source.
??	The BDP-Medium system shall deliver an SW transmission to an audience in all directions from the transmitting source.
??	The BDP-Heavy system shall deliver an SW transmission to an audience in all directions from the transmitting source.
??	All BDP system variants shall deliver an FM transmission to an audience in all directions from the transmitting source.
??	The BDP-Medium system shall deliver an VHF transmission to an audience in all directions from the transmitting source.
??	The BDP-Heavy system shall deliver an VHF transmission to an audience in all directions from the transmitting source.
??	All BDP system variants shall deliver a UHF transmission to an audience in all directions from the transmitting source.
??	All BDP system variants shall ingest A/V files encoded in common file formats; convert them to a common format; and store for future dissemination.
??	All BDP system variants shall ingest an FM demodulated digital stream; convert stream to a common format; and store in a file for future dissemination.
??	The media processing ingest, storage, and broadcast, along with log file storage, shall be controlled by the Media Control inputs.
??	All BDP system variants shall stream the Media Broadcast Data created from the stored media files for dissemination.
??	All BDP system variants shall convey the progress, status, and content of the Media Processing, stored media files, and stored log files.
??	All BDP system variants shall store and retrieve cellular site survey information in a file.
??	All BDP system variants shall store and retrieve the results of BIT in a file.
??	All BDP system variants shall store and retrieve the operational reports.
??	All BDP system variants shall store and retrieve the maintenance reports.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall decode and transform the data stream into a discrete-time digital stream that is amplitude modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the AM Waveform RF Broadcast Pre-Amp Data Output.
??	The BDP-Medium system shall calculate the Average Reflected Power from the AM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Heavy system shall decode and transform the data stream into a discrete-time digital stream that is amplitude modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the AM Waveform RF Broadcast Pre-Amp Data Output.
??	The BDP-Heavy system shall calculate the Average Reflected Power from the AM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Medium system shall decode and transform the data stream into a discrete-time digital stream that is modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the SW Waveform RF Broadcast Pre-Amp Data Output.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall calculate the Average Reflected Power from the SW Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Heavy system shall decode and transform the data stream into a discrete-time digital stream that is modulated on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall upsample, filter, and convert the digital audio stream from the Transmission Input Processing into an analog signal creating the SW Waveform RF Broadcast Pre-Amp Data Output.
??	The BDP-Heavy system shall calculate the Average Reflected Power from the SW Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Light system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Light system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Light system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Light system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Light system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Medium system shall frequency demodulate a designated bandwidth and filter the FM Rebroadcast Received RF Data signal, then transform it into a discrete-time digital stream; all controlled by the Waveform Control Inputs.
??	The BDP-Medium system shall compress, format, and internally store in the Smart-Silvia-Sys the FM Rebroadcast discrete-time digital FM data stream.
??	The BDP-Medium system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall decompress the discrete-time digital FM data stream and FM modulate on the new RF carrier frequency creating the audio data output stream.
??	The BDP-Medium system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
??	The BDP-Medium system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Heavy system shall frequency demodulate a designated bandwidth and filter the FM Rebroadcast Received RF Data signal, then transform it into a discrete-time digital stream; all controlled by the Waveform Control Inputs.
??	The BDP-Heavy system shall compress, format, and internally store in the Smart-Silvia-Sys the FM Rebroadcast discrete-time digital FM data stream.
??	The BDP-Heavy system shall decode and transform the FM data stream into a discrete-time digital stream; filter the signal, applying pre-emphasis; and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall decompress the discrete-time digital FM data stream and FM modulate on the new RF carrier frequency creating the audio data output stream.
??	The BDP-Heavy system shall differentially encode the RDS/RBDS text converting it to bi-phase symbols and modulate on the FM subcarrier using DSB-SC modulation; extract the audio information from the FM data stream; then combine these two signals transforming them into a discrete-time digital stream and FM modulate on the RF carrier; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall use the digital audio stream from the Transmission Input Processing along with the control inputs to upsample, filter, and convert this to an analog signal creating the FM Waveform RF Broadcast Pre-Amp Data Output.
??	The BDP-Heavy system shall calculate the Average Reflected Power from the FM Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall decode and transform the data stream into three separate (Video Data Streams) digital representations (discrete-time analytic signals) of the analog audio, analog video luma, and analog video chroma signals; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall use the digital audio, luma, and chroma signal streams along with the control inputs to modulate the video luma signal on the RF carrier, the chroma signal on the color subcarrier, and the audio on the audio subcarrier that are combined into the video signal that is then converted to an analog signal creating the RF Broadcast Pre-Amp Data Output.
??	The BDP-Medium system shall calculate the Average Reflected Power from the ATV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Heavy system shall decode and transform the data stream into three separate (Video Data Streams) digital representations (discrete-time analytic signals) of the analog audio, analog video luma, and analog video chroma signals; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall use the digital audio, luma, and chroma signal streams along with the control inputs to modulate the video luma signal on the RF carrier, the chroma signal on the color subcarrier, and the audio on the audio subcarrier that are combined into the video signal that is then converted to an analog signal creating the RF Broadcast Pre-Amp Data Output.
??	The BDP-Heavy system shall calculate the Average Reflected Power from the ATV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	The BDP-Medium system shall receive the data stream and output it as the Video Data Stream; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall randomize, encode, and interleave the data from the Video Data Stream; group the bits into symbols and modulate on the RF carrier using the appropriate method dictated by the DTV Video Standard; then convert to an analog signal creating the RF Broadcast Pre-Amp Data Output.
??	The BDP-Medium system shall calculate the Average Reflected Power from the DTV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Medium system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	The BDP-Heavy system shall receive the data stream and output it as the Video Data Stream; all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall randomize, encode, and interleave the data from the Video Data Stream; group the bits into symbols and modulate on the RF carrier using the appropriate method dictated by the DTV Video Standard; then convert to an analog signal creating the RF Broadcast Pre-Amp Data Output.
??	The BDP-Heavy system shall calculate the Average Reflected Power from the DTV Received RF Data signal, all controlled by the parameters of the Waveform Control Inputs.
??	The BDP-Heavy system shall integrate the estimated forward-transmitted power and reflected-power measurements and then calculate the VSWR value, generating fault notifications for erroneous conditions.
??	All BDP system variants shall be capable of digital product transfer with no file corruption.
??	The Smart-Silvia-Sys shall use an antenna to increase broadcast range.
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Table B.7 – continued from previous page

Specification	Key Performance Parameter
??	All BDP system variants shall be capable of disseminating data on an approved network with a reasonable response time of less than four (4) hours.

B.2 Key System Attributes

Table B.8: Key System Attribute Specifications

Specification	Key System Attribute
??	The system shall be capable of Single Mode Broadcast.
??	The BDP-Medium system shall be capable of Single Mode Broadcast.
??	The BDP-Medium system shall be capable of Multi-Mode Broadcast.
??	The BDP-Medium system shall be capable of simultaneously broadcasting both FM radio signals and SMS dissemination.
??	The BDP-Medium system shall be capable of simultaneously broadcasting both FM and AM radio signals.
??	The BDP-Medium system shall be capable of simultaneously broadcasting FM radio and TV signals.
??	The BDP-Medium system shall be capable of simultaneously broadcasting FM and SW radio signals.
??	The BDP-Heavy system shall be capable of Single Mode Broadcast.
??	The BDP-Heavy system shall be capable of Multi-Mode Broadcast.
??	The BDP-Heavy system shall be capable of simultaneously broadcasting both FM radio signals and SMS dissemination.
??	The BDP-Heavy system shall be capable of simultaneously broadcasting both FM and AM radio signals.
??	The BDP-Heavy system shall be capable of simultaneously broadcasting FM radio and TV signals.
??	The BDP-Heavy system shall be capable of simultaneously broadcasting FM and SW radio signals.
??	All BDP system variants shall provide a user interface as defined in the Smart-Silvia-Sys SUM.
??	All BDP system variants shall have a command line environment for authorized users to access the operating system architecture.
??	All BDP system variants shall be capable of manually ingesting media from different sources.
??	All BDP system variants shall be capable of receiving and processing a pre-encoded IP stream.
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Table B.8 – continued from previous page

Specification	Key System Attribute
??	All BDP system variants shall be capable of receiving an FM radio program and storing the content for later rebroadcasting.
??	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	The BDP-Medium system shall maintain AM broadcast operation in the presence of interference generated by external sources.
??	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	The BDP-Heavy system shall maintain AM broadcast operation in the presence of interference generated by external sources.
??	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	The BDP-Medium system shall maintain SW broadcast operation in the presence of interference generated by external sources.
??	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	The BDP-Heavy system shall maintain SW broadcast operation in the presence of interference generated by external sources.
??	All BDP system variants shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	All BDP system variants shall maintain FM broadcast operation in the presence of interference generated by external sources.
??	The BDP-Medium system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	The BDP-Medium system shall maintain VHF broadcast operation in the presence of interference generated by external sources.
??	The BDP-Heavy system shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
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Table B.8 – continued from previous page

Specification	Key System Attribute
??	The BDP-Heavy system shall maintain VHF broadcast operation in the presence of interference generated by external sources.
??	All BDP system variants shall not generate detrimental out-of-band interference in the adjacent channels or frequency bands nor create detrimental conducted radiation.
??	All BDP system variants shall maintain UHF broadcast operation in the presence of interference generated by external sources.
??	The system operator shall be able to control the system broadcasts using a device with a wired or wireless connection at a standoff distance of at least 100m.
??	The BDP-Medium system shall visually depict the RF propagation on a device.
??	The BDP-Heavy system shall visually depict the RF propagation on a device.
??	All BDP system variants shall run a self-test at startup and include a visual indicator of its operational status.
??	All BDP system variants shall be able to store and export BIT logs in .txt and .csv formats.
??	All BDP system variants shall store digital files received for transmission using 2 TB of internal storage.
??	All BDP system variants shall be able to manually upload and download digital files using external SD card, CD, and DVD formats.
??	The system shall locally store reports for up to 12 months and be capable of exporting in .txt, .csv, and .xml formats.
??	All BDP system variants shall be tested to meet applicable environmental standards as outlined in Military Standard 810G (MIL-STD-810G).
??	All BDP system variants shall withstand the effects of shock (Transit Drop) per Military Standard 810H (MIL-STD-810H), Method 516.6, Procedure IV.
??	All BDP system variants shall withstand the effects of vibration (General) per Military Standard 810H (MIL-STD-810H), Method 514.6, Procedures I and III.
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Table B.8 – continued from previous page

Specification	Key System Attribute
??	The BDP-Light system shall be modular and packaged for transport into 2 ruggedized cases.
??	The BDP-Medium system shall be modular and packaged for transport into 10 ruggedized cases.
??	The complete BDP-Light system shall weigh no more than 100 pounds.
??	The BDP-Light core system shall weigh no more than 10 pounds.
??	The complete BDP-Medium system shall weigh no more than 500 pounds.
??	The BDP-Medium core system shall weigh no more than 65 pounds.
??	The complete BDP-Heavy system shall weigh no more than 2000 pounds.
??	The BDP-Heavy core system shall weigh no more than 65 pounds.
??	The BDP-Light system shall be capable of operating on an internal military standard radio battery.
??	The BDP-Light system shall be able to connect to external 120/240 VAC, 50/60 Hz power.
??	The BDP-Medium system shall be capable of connecting to a 3 kW generator producing 120/240 VAC, 50/60 Hz power.
??	The BDP-Heavy system shall be capable of connecting to a 10 kW generator producing 120/240 VAC, 50/60 Hz power.
??	All BDP system variants will conform to the electromagnetic environmental effects requirements as documented in DOD Directive 3222.3.
??	The BDP-Light system shall be capable of continuously transmitting for 8 hours per day for 30 consecutive days.
??	The BDP-Medium system shall be capable of continuously transmitting for 18 hours per day for 30 consecutive days.
??	The BDP-Heavy system shall be capable of continuously transmitting for 18 hours per day for 30 consecutive days.
??	The BDP-Heavy system shall be capable of being set up in one (1) hour with five (5) soldiers.
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Table B.8 – continued from previous page

Specification	Key System Attribute
??	The BDP-Medium system shall be capable of being set up in one (1) hour with five (5) soldiers.
??	The BDP-Light system shall be capable of being set up in thirty (30) minutes with three (3) soldiers.
??	The BDP-Heavy system shall be erectable by a five (5) person team.
??	The BDP-Medium system shall be erectable by a five (5) person team.
??	The BDP-Light system shall be erectable by a three (3) person team.
??	All BDP system variants shall be transportable by air, ground, and maritime resources.
??	The BDP-Light system shall be configured in ruggedized transit cases, not to exceed 2-man lift in accordance with Military Standard 1472G (MIL-STD-1472G) and meet commercial airline size and dimension requirements for checked baggage (Domestic and International travel).
??	The BDP-Medium system shall be configured in ruggedized transit cases, not to exceed 2-man lift in accordance with Military Standard 1472G (MIL-STD-1472G) and meet commercial airline size and dimension requirements for checked baggage (Domestic and International travel).
??	All BDP system variants shall interface with an approved external broadcast playlist manager that will provide the operator the ability to manage programming in real-time.
??	All BDP system variants' playlists shall have continuous broadcast programming with a pause, resume, repeat, and schedule/-timer functions, and a minimum time block of four (4) hours.