1. (normative)  
   Communication system baseline definition (CSBD) - DRD
   1. DRD identification
      1. Requirement identification and source document

This DRD is called from ECSS-E-ST-50, requirement 5.2.3.3a.

* + 1. Purpose and objective

The communication system baseline definition (CSBD) is the top level design document produced by the communication system supplier to define the communication system to be developed for the mission. The CSBD forms the basis for all other specification and design activities undertaken by the communication system supplier, as well as constituting the baseline for generating cost and schedule information.

The CSBD constitutes the formal response to the CSRD (see ECSS-E-ST-50 Annex A). All requirements in the CSRD are traced in the CSBD and appropriately apportioned into specific CSBD clauses. Furthermore, any additional requirements can be derived in the CSBD to ensure common understanding and unambiguous interpretation of the CSRD requirements.

* 1. Expected response
     1. Scope and content

Introduction

The CSBD shall contain a description of the purpose, objective, content and the reason prompting its preparation.

Applicable and reference documents

The CSBD shall list the applicable and reference documents in support to the generation of the document.

Mission description and communication system overview

The CSBD shall describe the main objectives and characteristics of the space mission.

The CSBD shall describe the communication system, including:

the intended communication system implementation,

the main concepts of the proposed communication system,

the system components of the communication system, indicating where they are located and how they interrelate, and

the proposed protocols and communication frequencies to be used within the intended communication system.

Mission constraints and implementation assumptions

The CSBD shall describe all mission constraints that affect the communication system.

1. These can include trajectory induced constraints such as out of contact, or hibernation mode, attitude induced constraints such as tumbling mode or antenna pointing limitations, and ground induced constraints such as ground station availability.

The CSBD shall describe all of the assumptions made in establishing the communication system baseline definition.

Communication system interfaces

The CSBD shall summarize the interfaces between the space network elements of the communication system and other entities onboard the spacecraft including:

the control interfaces for the onboard elements of the communication system, indicating how the onboard data handling system manages space link communication;

the data interfaces that enable onboard entities to send data to and receive data from the ground;

For missions that have multiple space segment elements, the CSBD shall summarize:

how the communication links between those elements are controlled, and

how data is transferred across them;

The CSBD shall summarize the interfaces between the ground network elements of the communication system and other ground entities, including:

the control interfaces for the ground elements of the communication system, indicating how the ground system manages space link communication;

the data interfaces that enable ground entities to send data to and receive data from the spacecraft.

Communication system analysis

The CSBD shall describe:

all of the communication system analysis and system studies to design a communication system that meets the objectives of the space mission, and

the justification of the analysis and studies referred to in B.2.1<6>a1.

The CSBD should:

list all communication system issues to be resolved by modelling or simulation, and

describe the modelling or simulation technique to be applied.

The CSBD shall list the expected performances that can be achieved by the proposed communication system and indicate whether these fully meet the mission needs.

Communication system design and implementation

The CSBD shall describe the technical approach to the design and implementation of the overall communication system and each of its components.

Communication system integration and technical verification and validation

The CSBD shall describe the technical approach to the integration and testing of the communication system elements, and the technical verification and validation of the communication system as a whole.

Communication system operations

The CSBD shall describe all of the operational procedures relating to the communication system for normal operations.

The CSBD shall describe all of the operational procedures relating to the maintenance of the communication system.

The CSBD shall describe special operational procedures to be used for contingency operation of the communication system, i.e. in case of degradation of its normal performance.

1. These operational procedures can include unidirectional operation of the communication system, e.g. command­in­the­blind and telemetry­in­the­blind, and operation at reduced space link data rates.

The CSBD shall describe the technical approach to monitoring the health and performance of the communication system.

The CSBD shall describe any communication system specific operations not covered in items B.2.1<9>a to d.

1. For example, these can include procedures to support in­flight communications experiments, reconfiguration of the communication system to support new mission parameters such as the addition of new flight elements, and procedures to adapt the communication system for use on other missions.

Special project facilities

The CSBD shall describe any special project facilities for the development and implementation of the communication system (e.g. the modification of existing ground facilities, or the adaptation of reused flight software).

Support to other disciplines

The CSBD shall describe the support to be provided to other spacecraft disciplines by the communication system supplier.

1. This can include the provision of simulation models of communication system components, and test harnesses.

Required input and output items and services

The CSBD shall list all of the deliverable items and services to be provided by the communication system supplier to support the mission.

The CSBD shall list all of the items and services to be provided by the communication system customer in order to support the development of the communication system.

1. These can include:
   * + space segment design documents and information;
     + ground segment design documents and information;
     + access to testbeds, prototypes, and engineering models for integration and testing;
     + simulation models of the ground and space segments.

CSRD vs. CSBD traceability matrix

The CSBD shall provide a CSRD versus CSBD traceability matrix, summarized in a table, providing the following information for each entry:

requirements - containing a list of all requirements in the CSRD;

reference - providing a cross reference indicating one or more CSBD paragraphs where the requirement is fulfilled;

compliance - indicating the level of the suppliers’ compliance of the CSBD to the CSRD with one of the following values:

* COMPLIANT,
* PARTIALLY COMPLIANT, or
* NON­COMPLIANT;

notes - briefly describing the justification in those cases where column three indicates partial or non­compliance.

To­be­resolved items

The CSBD shall list all of the items for which a clear resolution has not yet been found.

To­be­determined and to­be­confirmed items

The CSBD shall list all of the items for which a specific communication system implementation cannot be committed without further information.

* + 1. Special remarks

None