Document ID: SS-CM-PLAN-001

Document Title: Configuration Management Plan

Version: 1.0

Status: Approved

Date: 12 August 2025

Parent Document: SS-ENG-PLAN-001: Engineering Management Plan

Table of Contents

1. Introduction

1.1 Purpose

This Configuration Management (CM) Plan details the procedures for identifying, controlling, and auditing the configuration of all hardware, firmware, and software

products developed and managed by Synthetic Systems. The purpose of this plan is to ensure the integrity, traceability, and control of our product configurations throughout their entire lifecycle, from initial design to fielding and through-life support. Effective CM is critical for managing complexity, ensuring product quality, and providing a rigorous framework for change management.

1.2 Scope

This plan applies to all Synthetic Systems personnel involved in the design, development, testing, manufacturing, and support of company products. It encompasses all hardware, software, firmware, and associated documentation that are designated as Configuration Items (CIs). This includes, but is not limited to, the Hydra-C4 Comms Module, the Trident-S Antenna Array, and the Aegis-Link Control Software. Adherence to the processes outlined herein is mandatory.

1.3 Acronyms and Definitions

- **CCB:** Configuration Control Board
- **CI:** Configuration Item
- **CM:** Configuration Management
- **FCA:** Functional Configuration Audit
- **PCA:** Physical Configuration Audit
- **PCR:** Problem/Change Request
- **Baseline:** A formally approved version of a Configuration Item, which serves as a formal basis for further development and can only be changed through formal change control procedures.
- **Configuration Item (CI):** An aggregation of hardware, software, or both, that is designated for configuration management and treated as a single entity in the configuration management process.

2. References

- **SS-ENG-PLAN-001:** Engineering Management Plan
- **SS-QM-PLAN-001:** Quality Management Plan
- **SS-TEST-PLAN-001:** Test & Evaluation Master Plan (TEMP)

3. Configuration Management Framework

3.1 Governance

The overall governance for engineering activities, including Configuration Management, is established in the **SS-ENG-PLAN-001: Engineering Management Plan**. This CM plan serves as the primary procedural document for implementing the CM requirements stipulated in the Engineering Management Plan. The Configuration

Control Board (CCB) is the primary authority for managing changes to established baselines.

3.2 Roles and Responsibilities

- **Chief Architect:** As the senior technical authority, the Chief Architect is ultimately responsible for the integrity of the product configuration and chairs the Configuration Control Board (CCB).
- **Project Managers:** Responsible for ensuring that the CM processes defined in this plan are followed for their respective projects and for allocating resources for CM activities.
- **Engineering Leads (Hardware & Software):** Responsible for identifying CIs, establishing initial baselines for their respective domains, and providing technical assessment for proposed changes.
- **CM Manager:** Responsible for administering the CM process, managing the CM tools and repository, facilitating CCB meetings, and maintaining the records of all configuration activities.
- **All Personnel:** Responsible for adhering to the change control process and for raising Problem/Change Requests when a deviation or potential improvement is identified.

4. Configuration Identification

4.1 Identifying Configuration Items (CIs)

Configuration Identification is the process of selecting the items that will be placed under configuration management. An item is designated as a CI if its change would require formal review and approval.

- **Hardware CIs:** Include major assemblies, sub-assemblies, custom circuit card assemblies (CCAs), and mechanical enclosures.
- **Software CIs:** Include executable files, source code modules, libraries, and the Aegis-Link Control Software as a whole.
- **Firmware CIs:** Include programmable logic device code and micro-controller code.
- **Documentation CIs:** Include specifications, design documents, test plans and procedures, and user manuals.

The Engineering Lead for each project is responsible for designating CIs in consultation with the Project Manager and Chief Architect. Each CI will be assigned a unique identifier that will be used for all tracking and documentation.

4.2 Establishing Configuration Baselines

A Configuration Baseline is a snapshot of the CIs that make up a product at a specific point in time. It represents a formally agreed-upon state of the product. Synthetic Systems utilises three main types of baselines:

1. **Functional Baseline:** Established early in the development lifecycle, typically after the System Requirements Review (SRR). It consists of the approved system-level specifications (e.g., SS-HYD-SPEC-001) that define the required performance and functionality.
2. **Allocated Baseline:** Established after the Preliminary Design Review (PDR). It allocates the higher-level requirements from the functional baseline to specific CIs and includes the detailed design specifications for each CI.
3. **Product Baseline:** Established at the conclusion of a successful Physical Configuration Audit (PCA), prior to formal delivery. It consists of the complete set of product documentation, including as-built hardware drawings, final software versions, and manufacturing instructions.

Once a baseline is established, any change to a CI within that baseline must be managed through the formal Configuration Control process described in Section 5.

5. Configuration Control

5.1 The Change Control Process

Configuration Control is the systematic process of evaluating, coordinating, approving or disapproving, and implementing all changes to baselined CIs. The goal is to ensure that all changes are assessed for their technical, cost, schedule, and supportability impacts before being implemented. No change to a baselined CI is permitted without an approved Problem/Change Request (PCR).

5.2 Problem/Change Request (PCR) Procedure

The PCR is the sole mechanism for requesting a change to a baselined CI. The procedure is as follows:

1. **Initiation:** Any employee can initiate a PCR using the company's designated form. The initiator must provide a detailed description of the problem or proposed change, identify the affected CIs and baselines, and provide a justification for the change. The PCR is logged in the central CM tracking system by the CM Manager, who assigns it a unique PCR number.
2. **Impact Assessment:** The PCR is assigned to the relevant Engineering Lead(s) for a formal impact assessment. The lead will coordinate with all affected functional areas (e.g., hardware, software, test, logistics) to evaluate the technical feasibility, and potential impacts on cost, schedule, performance, and interoperability. The

findings of this assessment are documented on the PCR form.

3. **CCB Review:** The completed PCR, including the impact assessment, is submitted to the Configuration Control Board (CCB) for review. The CCB convenes weekly to review all open PCRs.
4. **Disposition:** During the review, the CCB will make one of the following dispositions:
    - **Approved:** The change is authorised for implementation.
    - **Rejected:** The change is not approved and will not be implemented. The justification for rejection is documented.
    - **Deferred:** The change is deemed valid but will be deferred for a future release or block update.
    - **More Information Required:** The PCR is returned to the impact assessment team for further analysis or clarification.
5. **Implementation and Verification:** For approved PCRs, the responsible Engineering Lead develops an implementation plan. Once the change is implemented, it is rigorously tested to verify that it has solved the original problem and has not introduced any unintended side effects. The results of this verification are documented and linked to the PCR.
6. **Closure:** Once the change has been successfully implemented and verified, the CM Manager formally closes the PCR in the tracking system. This closure includes updating all relevant documentation and establishing a new baseline if required.

5.3 Configuration Control Board (CCB)

The Configuration Control Board (CCB) is the central authority for managing changes to all product baselines. As established in **SS-ENG-PLAN-001**, the CCB is responsible for providing a disciplined and consistent approach to change management.

- **Chair:** Chief Architect
- **Core Members:** CM Manager, Head of Engineering, Head of Operations, Lead Software Engineer, Lead Hardware Engineer.
- **Ad-Hoc Members:** Project Managers, Test Leads, and other subject matter experts will be invited as required based on the content of the PCRs under review.
- **Mandate:** The CCB is responsible for reviewing the technical and programmatic impacts of all proposed changes and making the final disposition on all PCRs. The CCB ensures that the integrity of the product baselines is maintained throughout the product lifecycle.

6. Configuration Status Accounting

6.1 Status Reporting

Configuration Status Accounting (CSA) is the recording and reporting of the information needed to manage configuration effectively. The CM Manager is responsible for maintaining a database that records the status of all CIs and PCRs.
Standard reports will be generated and distributed monthly to project and executive management. These reports will include:

- A list of all current baselines.
- The status of all open and closed PCRs.
- A summary of all changes implemented in the reporting period.
- Metrics on the number of changes and the time taken to process them.

6.2 Traceability

The CM system shall provide full traceability. It must be possible to trace from a system-level requirement in the functional baseline down to the specific CI that implements it, and to trace any change back to the approved PCR that authorised it.

7. Configuration Audits

Configuration audits are conducted to verify that a product's performance conforms to its specification and that its configuration is accurately documented.

7.1 Functional Configuration Audit (FCA)

An FCA is a formal audit to verify that the actual performance of a CI meets the requirements defined in its functional and allocated specifications. It is typically conducted by reviewing the results of formal testing, as defined in the relevant Test & Evaluation Plan. An FCA is a prerequisite for establishing the product baseline.

7.2 Physical Configuration Audit (PCA)

A PCA is a formal audit to verify that the as-built product accurately reflects the design and manufacturing documentation that comprises the product baseline. This includes a detailed examination of drawings, parts lists, software version files, and manufacturing records. A successful PCA is required before a product can be formally accepted and delivered to a customer.

8. Document Control

This document is a controlled document under the Synthetic Systems Quality Management System (QMS). The official version is maintained electronically by the CM Manager. Any printed copies are considered uncontrolled. This plan will be reviewed biennially or as required by significant changes to company processes or parent documents.