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1. Introduction

1.1 Purpose

The purpose of this Engineering Management Plan (EMP) is to define the overarching processes, standards, and governance framework for all engineering activities undertaken at Synthetic Systems. This plan ensures a consistent, disciplined, and high-integrity approach to the design, development, and through-life support of our products and systems. It provides the authoritative framework for engineering decision-making, risk management, and quality assurance, directly supporting the strategic objectives outlined in the *SS-CORP-PLAN-001 Corporate Plan 2025-2028*.

1.2 Scope

This EMP applies to all personnel, processes, and resources within the Synthetic Systems Engineering directorate. It encompasses the full lifecycle of all products, including the Hydra-C4 Comms Module, Trident-S Antenna Array, and Aegis-Link Control Software. Compliance with this plan is mandatory for all engineering staff, project managers, and contractors involved in technical development, test, and support activities.

1.3 Policy Statement

Synthetic Systems is committed to engineering excellence as a core pillar of its business strategy. All engineering activities shall be conducted in a systematic and controlled manner, adhering to the principles of quality, security, and safety. We will foster a culture of technical rigour, innovation, and continuous improvement to deliver superior, reliable, and secure sovereign capabilities to our customers. All product development must adhere to the quality standards outlined in *SS-QM-PLAN-001* and the security principles defined in *SS-SEC-POL-001*.

2. References

This EMP is a subordinate document to the following corporate plans and policies:

- **SS-CORP-PLAN-001:** Corporate Plan 2025-2028
- **SS-QM-PLAN-001:** Quality Management Plan
- **SS-SEC-POL-001:** Defence Security Policy

3. Engineering Governance and Roles

3.1 Head of Engineering

The Head of Engineering is the owner of this plan and holds ultimate accountability for all engineering outcomes at Synthetic Systems. They are responsible for resourcing the engineering directorate, maintaining technical capabilities, and ensuring compliance with this EMP.

3.2 Chief Engineer

The Chief Engineer is the senior technical authority for the company. They are responsible for setting technical strategy, overseeing the design and development of all products, chairing key technical reviews, and providing final technical approval for product releases.

3.3 Project Engineering Manager

For each project, a Project Engineering Manager (PEM) will be assigned. The PEM is responsible for the day-to-day management of engineering activities, including planning, execution, and reporting, ensuring the project's technical solution meets its requirements, budget, and schedule.

4. Engineering Lifecycle

All engineering activities at Synthetic Systems shall follow a structured lifecycle model to ensure a systematic progression from concept to disposal. The lifecycle consists of five distinct phases, each culminating in a formal gate review to assess readiness to proceed to the next phase.

4.1 Phase 1: Concept

The Concept phase focuses on exploring user needs and defining a high-level operational concept and system requirements.

- **Key Activities:**
  - Mission analysis and requirements elicitation.
  - Technology feasibility studies and trade-off analysis.

    - Development of the initial System Requirements Specification (SRS).
    - High-level architectural concepts.
- **Gate Review:** System Requirements Review (SRR).
- **SRR Objective:** To ensure the system requirements are fully defined, understood, and achievable within programmatic constraints before committing to detailed design.

4.2 Phase 2: Design

The Design phase translates the validated system requirements into a detailed technical solution. This phase is typically iterative, involving preliminary and detailed design stages.

- **Key Activities:**
    - Development of system architecture and subsystem specifications.
    - Hardware and software detailed design.
    - Development of engineering models and simulations.
    - Creation of the initial Test and Evaluation Master Plan (TEMP).
    - Development of the full technical data pack, including drawings and specifications.
- **Gate Reviews:**
    - **Preliminary Design Review (PDR):** To affirm the preliminary design meets the system requirements with acceptable risk and within cost and schedule constraints.
    - **Critical Design Review (CDR):** To demonstrate the maturity of the design and establish that it is ready for implementation, fabrication, and integration. The CDR is the final technical review before production commences.

4.3 Phase 3: Implementation

The Implementation phase involves the fabrication, coding, and integration of the system components as defined in the technical data pack from the Design phase.

- **Key Activities:**
    - Procurement of materials and commercial off-the-shelf (COTS) components.
    - Fabrication of custom hardware components.
    - Software coding and unit testing.
    - Subsystem and system-level integration.
    - Formal peer reviews of all software code.
- **Gate Review:** Test Readiness Review (TRR).
- **TRR Objective:** To verify that the system is ready for the commencement of formal Test and Evaluation. This includes confirming that all components are

integrated, and test procedures, equipment, and personnel are in place.

4.4 Phase 4: Test & Evaluation (T&E)

The T&E phase systematically verifies and validates that the implemented system meets all specified performance and functional requirements.

- **Key Activities:**
  - Execution of formal verification and validation procedures as outlined in the TEMP.
  - Developmental Testing (DT) to verify technical specifications.
  - Operational Testing (OT) to validate effectiveness in a simulated operational environment.
  - Defect tracking and resolution.
  - Collection and analysis of all test data.
- **Gate Review:** Physical Configuration Audit (PCA).
- **PCA Objective:** To verify that the as-built system configuration matches the approved technical documentation and that all required testing is complete and successful. Successful completion of the PCA is required for product acceptance.

4.5 Phase 5: In-Service Support

The In-Service Support phase covers all activities following the delivery and acceptance of the product by the customer.

- **Key Activities:**
  - Management of the operational baseline.
  - Deployment of software patches and hardware upgrades.
  - Obsolescence management.
  - Help desk and field service support.
  - Disposal and decommissioning activities at the end of the product's life.
- **Gate Review:** In-Service Support Review (ISSR).
- **ISSR Objective:** Conducted periodically to assess the health, performance, and supportability of the deployed system and to plan for future upgrades or replacement.

5. Configuration Management

5.1 Configuration Control Board (CCB)

The Configuration Control Board (CCB) is hereby formally established as the authority for managing and controlling changes to all established product baselines. The CCB ensures that all changes are properly documented, evaluated for impact, and approved before implementation.

- **Charter:** The CCB is chartered to provide rigorous governance over the configuration of all Synthetic Systems products. Its primary role is to ensure the integrity of product baselines throughout the entire lifecycle.
- **Roles and Responsibilities:**
    - **Chair:** Chief Engineer.
    - **Members:** Representatives from Program Management, Engineering, Test, and Logistics.
    - **Responsibilities:** Reviewing and dispositioning all Engineering Change Proposals (ECPs), managing deviations and waivers, and approving updates to configuration baselines.
- **Governing Procedure:** All CCB activities, including the processing of ECPs, shall be conducted in accordance with the **SS-CM-PLAN-001 Configuration Management Plan**.

6. Quality Management

All engineering activities, processes, and deliverables shall comply with the Synthetic Systems Quality Management System (QMS). All product development must adhere to the quality standards outlined in **SS-QM-PLAN-001 Quality Management Plan**. This includes adherence to processes for internal audits, non-conformance reporting, and corrective actions to ensure the highest level of quality and reliability in our products.

7. Security Integration

Engineering activities shall incorporate the principles and requirements of the **SS-SEC-POL-001 Defence Security Policy**. Security considerations must be integrated into the design process from the outset to ensure our products are resilient and protected against relevant threats. Security risk assessments will be conducted as part of the design review process.

8. Safety and Risk Management

Synthetic Systems is committed to the development of safe and reliable systems. Safety shall be a primary consideration throughout the engineering lifecycle. Technical risk shall be proactively identified, assessed, and managed at all stages of product development.

Technical risk assessments are a mandatory component of the key lifecycle gate reviews (SRR, PDR, CDR). These assessments will identify potential hazards and failure modes, evaluate their likelihood and consequence, and ensure mitigation strategies are implemented and tracked. The detailed procedures for risk management, including the maintenance of a project risk register, will be defined in the

SS-RM-PROC-001: Risk Management Process.

9. Document Control

This EMP is a controlled document. The official version is maintained by the Engineering Directorate. Any printed copies are considered uncontrolled. The Head of Engineering is responsible for the biennial review and maintenance of this plan.