Document ID: SS-AEG-TEST-001
Document Title: Aegis-Link Software Test & IV&V Plan
Version: 1.0
Status: Released
Date: 13 August 2025

1. Introduction

1.1 Purpose

This document describes the strategy, scope, resources, and procedures for conducting the formal testing of the Aegis-Link Control Software. It encompasses all verification and validation activities designed to ensure that the software meets the functional and non-functional requirements detailed in the **SS-AEG-SRS-001: Aegis-Link Software Requirements Specification (SRS)**.

1.2 Scope

This plan covers all testing activities for the Aegis-Link software, including multiple levels of testing from unit to user acceptance. It also outlines the approach for Independent Verification & Validation (IV&V) to provide an additional layer of quality assurance. The overall test strategy, including defect management and reporting, is governed by the master framework established in **SS-TEST-PLAN-001: Test & Evaluation Master Plan (TEMP)**.

2. Applicable Documents

- **SS-AEG-SRS-001:** Aegis-Link Software Requirements Specification (SRS)
- **SS-TEST-PLAN-001:** Test & Evaluation Master Plan (TEMP)

3. Test Strategy

3.1 Levels of Testing

A multi-level testing strategy will be employed to progressively build confidence in the software's quality.

- **Level 1: Unit Testing:** Each individual software component (e.g., function, class) will be tested in isolation by the developer to verify its logic.
- **Level 2: Integration Testing:** Verified units will be progressively integrated and tested to ensure their interfaces and interactions function correctly.
- **Level 3: System Testing:** The complete, integrated Aegis-Link software will be tested as a whole in a representative environment to verify all requirements in the SRS. This is the formal verification phase.
- **Level 4: User Acceptance Testing (UAT):** Formal testing conducted with representative end-users to validate that the software is fit for its intended

operational purpose.

3.2 Test Environment

System testing will be conducted in the Synthetic Systems integration laboratory. The test environment will consist of:

- A dedicated test server running the Aegis-Link software.
- A hardware-in-the-loop simulator capable of simulating the interfaces and data streams of the Hydra-C4 and Trident-S systems.
- At least one production-representative Hydra-C4 and Trident-S unit for final integration testing.

4. Independent Verification & Validation (IV&V)

To ensure the highest level of quality and objectivity, an IV&V agent will be engaged.

- **IV&V Agent:** An external, third-party contractor specializing in defence software assurance.
- **Role:** The IV&V agent will be provided with the SRS and the final software build. They will independently develop and execute a subset of tests to verify critical functionality and performance requirements. Their findings will be delivered in a formal IV&V report. This activity provides an independent risk reduction measure, as outlined in the **SS-TEST-PLAN-001**.

5. Requirements Verification Traceability Matrix (RVTM)

The following matrix provides traceability from each requirement in **SS-AEG-SRS-001** to a corresponding test case identifier. Detailed test procedures will be developed for each test case.

Requirement ID	Requirement Summary	Test Case ID
Functional		
REQ-FUN-001	Display Hydra-C4 Status	TC-STATUS-01
REQ-FUN-002	Display Trident-S Status	TC-STATUS-02
REQ-FUN-003	Consolidated Health Dashboard	TC-STATUS-03
REQ-FUN-004	Visual Fault Alert	TC-STATUS-04
REQ-FUN-005	Initiate Hydra-C4 BIT	TC-CONTROL-01

REQ-FUN-006	Command Trident-S Acquisition	TC-CONTROL-02
REQ-FUN-007	Configure Throughput Rate	TC-CONTROL-03
REQ-FUN-008	Select RF Polarization	TC-CONTROL-04
REQ-FUN-009	Log Operator Commands	TC-LOG-01
REQ-FUN-010	Log Viewer	TC-LOG-02
REQ-FUN-011	Export Logs	TC-LOG-03
REQ-FUN-012	Role-Based Access Control	TC-USER-01
REQ-FUN-013	Administrator User Management	TC-USER-02
REQ-FUN-014	Unique User Login	TC-USER-03
Non-Functional		
REQ-NFR-001	UI Response Time < 500ms	TC-PERF-01
REQ-NFR-002	Status Update Rate ≥ 1 Hz	TC-PERF-02
REQ-NFR-003	Initialization Time < 30s	TC-PERF-03
REQ-NFR-004	MTBCF ≥ 5,000 hours	TC-RELY-01 (Analysis)
REQ-NFR-005	Usability / Training Time	TC-USE-01 (UAT)
REQ-NFR-006	Critical Alert Display	TC-USE-02
REQ-NFR-007	Hashed & Salted Passwords	TC-SEC-01 (IV&V)
REQ-NFR-008	Inactivity Timeout	TC-SEC-02
REQ-NFR-009	Modular Architecture	TC-MAINT-01 (Audit)
REQ-NFR-010	Code Commenting Standard	TC-MAINT-02 (Audit)
Interface		
REQ-EIR-001	Interface with Hydra-C4	TC-INT-01
REQ-EIR-002	Interface with Trident-S	TC-INT-02

6. Defect Management

All defects, anomalies, and failed test cases identified during the execution of these tests shall be formally documented and tracked using a Defect Report (DR). The lifecycle for defect management (logging, triage, resolution, verification, closure) shall follow the process defined in **SS-TEST-PLAN-001**, Section 7.