CS Innovations

A Westinghouse Electric Company

Westinghouse Non-Proprietary Class 3

6002-00000-NP

ALS Management Plan

Revision 4

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APPROVALS

Function	Name and Title	Signature and Date
Author	Mandy Knievel ALS Project Manager	Electronic Approval – Refer to Release Record
Reviewer	Steve Seaman Manager, ALS Platform Engineering	Electronic Approval – Refer to Release Record
Approved	Scott Roberts Director Scottsdale Operations	Electronic Approval – Refer to Release Record

REVISION HISTORY

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OPEN ITEMS

Item	Description	Status

Preface

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This Management Plan addresses two aspects of ALS Platform management: 1) development project management and 2) overall product life-cycle management. A project management plan addresses a set of unique activities that have a precisely defined start date, end date and deliverables. An overall life-cycle management plan addresses an on-going set of activities that occur over the life of a product that may or may not have precise, pre-defined dates and deliverables.

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1 Overview

1.1 Project Summary

1.1.1 Purpose, Scope and Objectives

The Advanced Logic System (ALS) is the CS Innovations (CSI) product name for a standardized platform that satisfies the needs of Class 1E safety critical Instrumentation & Control (I&C) applications in the nuclear power plant industry. The objective of the ALS Platform project is to deliver a modern, Class 1E safety-related platform that can span across a variety of Class 1E applications such as reactor protection systems (RPS), engineered safeguards features actuation system (ESFAS) and other safety system applications. The ALS targets applications where reliability and integrity are of the highest importance.

The Platform incorporates advanced features to allow for diagnostics, testability, and modularity. The ALS Platform is designed to be at the appropriate level of complexity to achieve high reliability and integrity while allowing flexibility to target multiple safety critical applications within a given nuclear power plant. Diagnostics and testing capabilities are designed into the ALS Platform to ensure there is a systematic approach to maintaining and testing systems in the field.

The ALS platform is highly customizable to support a wide variety of safety applications. The ALS architecture is based on the NRC-approved MSFIS system (refer to NRC approval under Docket 50-482, Amendment 181 to License No. NPF-42) (Reference 1). The ALS Platform provides many improved installation and support features including increased testability, advanced diagnostics, increased integrity and reliability.

The ALS is an analog and digital platform based on solid-state devices, such as opto-couplers, field programmable gate arrays (FPGA's), line drivers, and field effect transistor (FET) power transistors. ALS utilizes solid state technology that provides a high level of integration and reliability. The high level of integration minimizes the number of logic components and reduces overall system hardware requirements. A simple system directly translates into increased reliability by having fewer components to fail and low power dissipation that increases system longevity. The fundamental ALS design philosophy is simplicity, integrity and reliability.

1.1.2 Objectives and Scope

The key project deliverables are the ALS Platform configuration items and supporting information as listed below.

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Key project activities include

- V&V
- Testing
- Equipment qualification (EQ).

- Configuration items for future, application-specific projects are out of scope from this project. A separate project plan will be initiated for each, future application-specific project.

The ALS Platform project's official statement of product requirements is contained in the following documents:

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1.1.3 Assumptions and Constraints

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- This Project follows the CSI QA program defined in Reference 2 and 3.
- The ALS Platform is based on the generic ALS system architecture and therefore, its components share a range of characteristics and commonalities, such as:
  - Common board communication, power management, board layout, device selection, etc.
  - Common 'Platform Requirements' and 'Platform Specifications'
  - Common Configuration Management (CM), Verification & Validation (VV) and Quality Assurance (QA)
  - Common Equipment Qualification (EQ)
  - Common and consistent documentation base
- This ALS Platform project reuses and extends technology from a previous application-specific project of an earlier instantiation of the ALS Platform (Reference 1).

1.1.4 Project Deliverables

The ALS Project delivers the following primary configuration items. The detailed list of all project deliverables is defined in the Configuration Status Accounting documents (Reference 4). There is one document per ALS board type.

- **ALS Printed Circuit Assemblies (PCAs)**.

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Table 1-1: ALS Platform-Level Documents

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Table 1-2: ALS Platform Component-Level Documents

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1.1.5 Requirements and Design Specification Document Flow

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Figure 1-1: Document Flow Diagram

1.1.6 Schedule and Budget Summary

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1.2 Evolution of the Plan

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2 References

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3 Definitions

Refer to the CSI document 6002-00040: "ALS Terms and Abbreviations" (Reference 14).

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4 Project Organization

4.1 External Interfaces

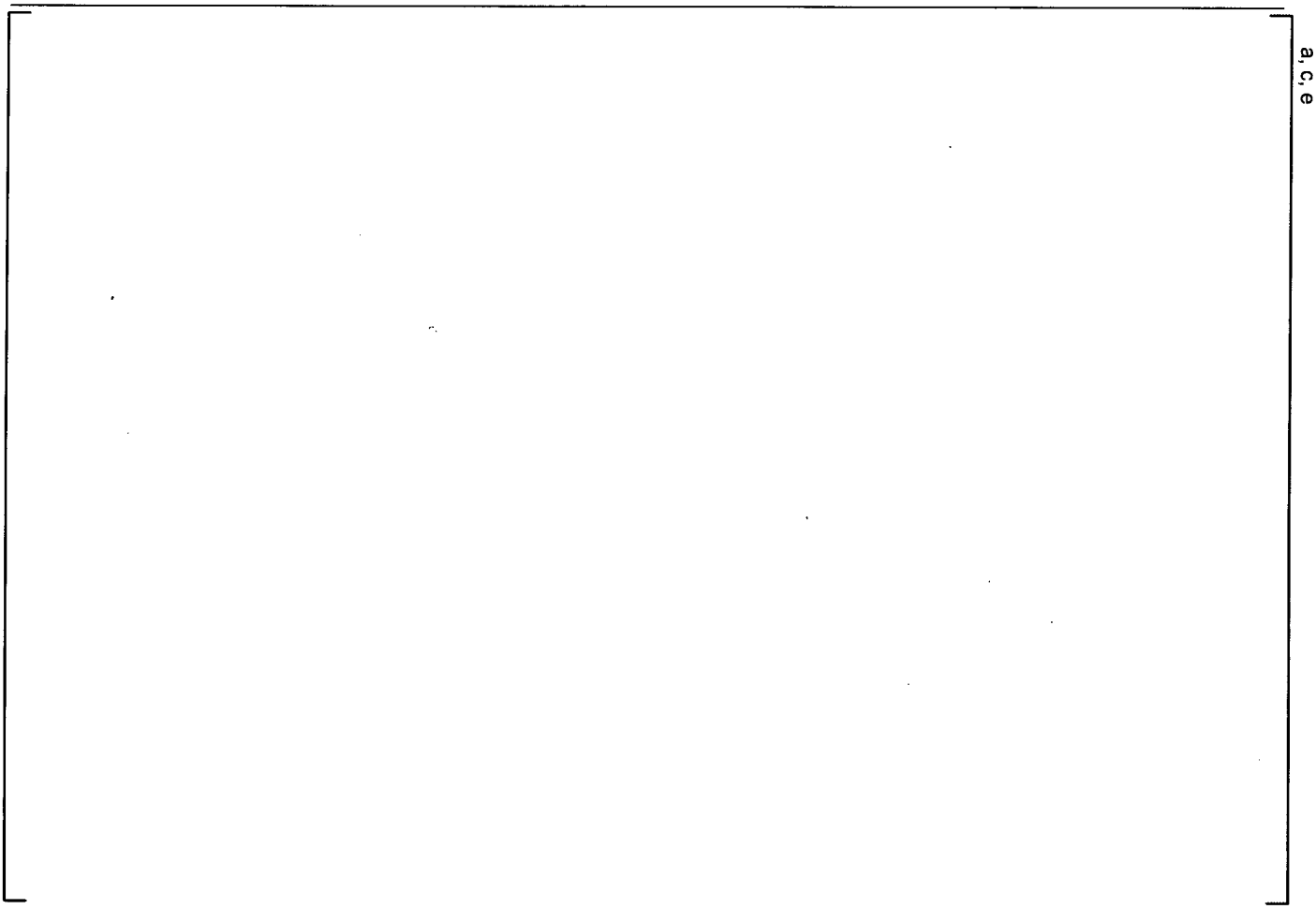

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Figure 4-1: Project Organization Structure

4.2 Internal Interfaces

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4.3 Roles & Responsibilities

A matrix of the project's major work activities and responsible entities is presented in Table 4-2: Roles & Responsibilities. The matrix covers the development activities for the generic ALS Platform. Future application-specific projects may expand the matrix. The decision to add additional activities shall be made during the planning stage and documented in the application-specific management plan.

Table 4-2: Roles & Responsibilities

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5 Managerial Process Plans

5.1 Project Start-up Plan

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5.2 Work Plan

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5.3 Control Plan

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5.4 Risk Management Plan

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5.5 Project Closeout Plan

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6 Technical Process Plans

6.1 Process Model

This chapter describes the different stages in the ALS Platform project and product life-cycle process model. The CSI project life-cycle model is defined in and is illustrated in Figure 6-1: ALS Platform Project Life-Cycle Process Model. It consists of the following stages:

- Planning
- Development
- Manufacturing
- System Test
- Installation
- Maintenance
- Retirement

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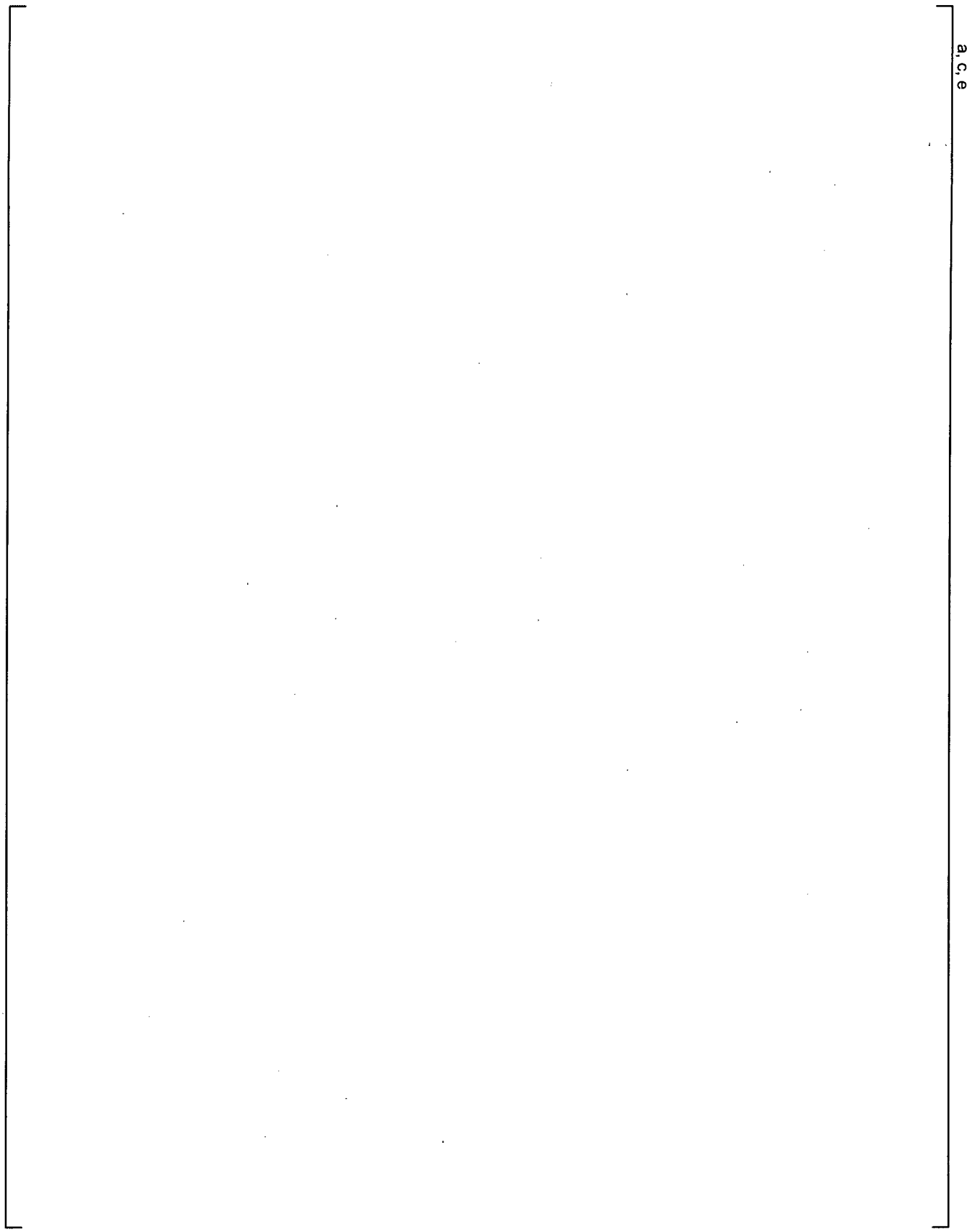

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Figure 6-1: ALS Platform Project Life-Cycle Process Model

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6.2 Methods, Tools and Techniques

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6.3 Infrastructure Plan

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6.4 Product Acceptance Plan

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7 Supporting Process Plans

7.1 Configuration Management Plan

The Project's configuration management plan is specified in Reference 5.

7.2 Verification and Validation Plan

The Project's verification and validation plan is specified in Reference 6.

7.3 Documentation Plan

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7.4 Quality Assurance Plan

The Project's quality assurance activities follow Reference 2 and 3. The QA Manager maintains a schedule indicating planned QA audits and other QA activities as described in Section 7.5.

7.5 Reviews and Audits Plan

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7.6 Problem Resolution Plan

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7.7 Subcontractor Management Plans

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7.8 Process Improvement Plan

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