Westinghouse Non-Proprietary Class 3

ALS Quality Assurance Plan

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Rev. 9

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APPROVALS

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WESTINGHOUSE NON-PROPRIETARY CLASS 3

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REVISION HISTORY

RECORD OF CHANGES

Revision	Author	Description	Completed

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DOCUMENT TRACEABILITY & COMPLIANCE

Created to Support the Following Document(s)	Document Number	Revision
ALS Management Plan	6002-00000	6

OPEN ITEMS

Item	Description	Status

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ACRONYMS AND TRADEMARKS

Acronyms used in the document are defined in 6002-00040 – ALS Terms and Abbreviations or included below to ensure unambiguous understanding of their use within this document.

Acronym	Definition
ALS	Advanced Logic System
ABTS	ALS Board Test System
CAPs	Westinghouse Corrective Actions Process
CGD	Commercial Grade Dedication
CIs	Configuration Items
CM	Configuration Management
C of C	Certificate of Conformance
CSI	CS Innovations
EQ	Equipment Qualification
FDR	Final Design Review
FPGA	Field Programmable Gate Array
IRC	Issue Review Committee
IV&V	Independent Verification and Validation
PDR	Preliminary Design Review
QA	Quality Assurance
QAR	Quality Activity Report
WEC	Westinghouse Electric Company

GLOSSARY OF TERMS

Standard terms used in the document are defined in 6002-00040 – ALS Terms and Abbreviations to ensure unambiguous understanding of their use within this document.

REFERENCES

Following is a list of references used throughout this document.

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SECTION 1
PURPOSE

To define the techniques, procedures, and methodologies that will be used by CS Innovations (CSI) to assure quality in the design and test developments of the Advanced Logic System (ALS) Platform, and in particular, in the FPGA design and test activities performed as a part of the platform developments.

The ALS Quality Assurance Plan has been written in accordance with the requirements defined by IEEE Std 730-1998. The plan covers the entire Field Programmable Gate Array (FPGA) development process, which includes processes such as Requirements Specification, Design, Implementation, Source/Data control, Reviews, Change Management, Configuration Management, and Release Management.

The ALS Quality Assurance Plan is intended for use on the generic Platform where the target system is a Class-1E safety related or mission critical system.

The ALS Quality Assurance Plan will be referenced in the Management Plan together with the CM Plan, IV&V Plan, and Test Plan.

The ALS Quality Assurance Plan is a platform specific Quality Assurance Plan and works under the 18 point criteria of 10CFR50 Appendix B, ISO 9001 (the most recent edition prior to the required compliance date), and ASME NQA-1-1994. Under nonconformance and corrective action, the program encompasses the reporting requirements of 10CFR Part21.

Westinghouse Electric Company, LLC (WEC) procedures that CS Innovations will incorporate into the Quality Assurance Program to establish compliance with the Quality Management System (QMS) are described in WEC 23.20 – Westinghouse Nuclear Automation/CS Innovations Interface Agreement. Per the Interface Agreement, CS Innovations may use specified WEC procedures in whole or part, depending on the applicability to the CS Innovations Quality Assurance Program stated in contractual requirements.

The ALS boards are developed to be generic ALS boards which can be configured and reused for different applications. Because of this, the ALS board lifecycle spans the ALS board development integration into an application-specific system. The objective is for CSI to develop and produce generic ALS boards to stock and then later integrate them into dedicated systems. The following subsections will outline the different development, manufacturing and test flows which are associated with ALS boards. Figure 1-1 shows a graphical representation of these flows.

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Figure 1-1: ALS development relationship to system development

SECTION 2
SCOPE

CSI is responsible for the supply of the Advance Logic System (ALS) equipment, systems and components for nuclear power generating facilities. Nuclear Automation supports CSI for the ALS Instrumentation and Controls (I&C) Interface.

The Westinghouse Electric Company, LLC interface agreement, WEC 23.20 – Westinghouse Nuclear Automation/CS Innovations Interface Agreement, may be used by CS Innovations in whole or part depending upon the applicability to the CS Innovations Quality Assurance Program and ALS Quality Assurance Plan. CS Innovations is continuing to transition to the Westinghouse Quality Management System.

Table 2-1: WEC 23.20 documents used in whole by CS Innovations

Document Number	Title

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Table 2-2: WEC 23.20 documents not used by CS Innovations

Document Number	Title

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Document Number	Title

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Table 2-3: CS Innovations documents using parts or references of WEC 23.20

Document Number	Title

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SECTION 3
MANAGEMENT

The ALS relationship between organizational units along with roles and responsibilities are documented in 6002-00000 - ALS Management Plan. The ALS Management Plan organization structure describes the primary internal and external project interfaces and their interactions. As shown in the ALS Management Plan Project Organization Structure, the QA team is independent from the development organization. This independence includes project cost and schedule requirements.

ALS development efforts within the scope of this document will be performed by personnel associated with the Engineering team. Quality efforts within the scope of this document will be performed by personnel associated with the Quality team.

The goal of Quality Assurance (QA) assigned to the project is to assure the quality and safety of ALS by:

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The ALS Quality team must have a close interaction with the development team in order to function effectively and meet its goals, QA:

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The ALS Quality Assurance Plan covers the CS Innovation Life Cycle model as documented in 9000-00310 - Project Creation Procedure.

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SECTION 4
DOCUMENTATION

4.1 MANAGEMENT PLAN

The Management Plan describes the management aspects of the project, such as organization, responsibilities, security aspects, project life cycle and schedule with milestones.

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4.2 TEST PLAN

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4.3 QA PLAN

The ALS Quality Plan is maintained by QA.

4.4 IV&V PLAN

6002-00003 – V&V Plan describes procedures, responsibilities and requirements for a comprehensive evaluation of the item being developed.

4.5 CM PLAN

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4.6 EQ PLAN

The Equipment Qualification (EQ) Plan presents and defines the methodologies and procedures used to conformance/type test a representative test specimen according to the requirements listed in the requirements specification. The EQ Plan will normally include electrical, environmental and seismic testing.

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4.7 ALS REQUIREMENTS SPECIFICATION

This specification focuses on common architectural aspects of the ALS design such as inter-board communication, backplane connector definitions, mechanical constraints on the system and other general requirements to ALS boards.

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4.8 ALS-XXX REQUIREMENTS SPECIFICATION

The ALS-xxx Requirements Specification is a complete description of the behavior of an ALS board. A new requirements specification is created for each ALS Board.

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4.9 ALS-XXX DESIGN SPECIFICATION

The ALS-xxx Design Specification is a detailed description of the ALS Hardware Design excluding the internal FPGA Design.

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4.10 ALS FPGA DESIGN SPECIFICATIONS

The ALS FPGA Design Specifications is a detailed set of documents that describe the ALS FPGA Design.

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SECTION 5
STANDARDS, PRACTICES, CONVENTIONS, AND METRICS

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SECTION 6
REVIEWS AND AUDITS

QA maintains an ALS Quality Activity Report (QAR) with updated information for ALS QA activities. The ALS QAR follows the format defined by the 9000-00310 - Project Creation Procedure.

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QA performs in-process audits, assessments or reviews of the ALS development and related processes according to the procedures identified in this section. QA plans and maintains audit schedules based on life cycle phases, the complex electronics products of each phase and past audit results.

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Table 6-1: Past Internal and External Audits

Company	Audit Type	Audit Dates	Number of Findings	Closed Date

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Company	Audit Type	Audit Dates	Number of Findings	Closed Date

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