Enclosure IV to GC 08-0024

CS Innovations Report 6002-00001, "ALS Quality Assurance Plan, Rev. 2
Non-proprietary

MAIN STEAM & FEEDWATER ISOLATION SYSTEM (MSFIS) CONTROLS REPLACEMENT

VENDOR SUBMITTAL APPROVAL

Name/Description	Document #/Rev	Date Submitted	Vendor Name	Comments
ALS QA Plan	6002-00001 Rev. 2	7/29/2008	CS Innovations	The purpose of Revision 2 is to provide proprietary and non-proprietary versions of the document. No other significant changes to the previously approved Revision 1.

Approver Signature	Approval Date
	7/30/2008

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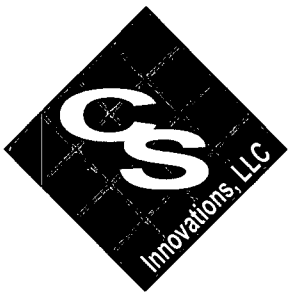
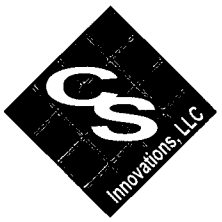
ALS
Advanced Logic System



6002-00001
ALS Quality Assurance Plan

Revision 2
July 28, 2008

CS Innovations, LLC
Scottsdale, AZ



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APPROVALS

Approvals are available in the proprietary version of the document.

RECORD OF CHANGES

Revision	Date	Description of changes	Made by
1	2/20/08	Initial release of document	Sten Sogaard
2	7/28/08	Added Proprietary / Non-Proprietary statements.	Sten Sogaard

OPEN ITEMS

Item	Description	Status

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1 Purpose

1.1 To define the techniques, procedures, and methodologies that will be used by CS Innovations 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.

1.2 The ALS QA Plan has been written in accordance with the requirements defined by IEEE Std 730-1998.

1.3 The plan covers the entire FPGA development process, which includes processes such as Requirements Specification, Design, Implementation, Source/Data control, Reviews, Change Management, Configuration Management, and Release Management.

1.4 The ALS QA Plan is intended for use on ALS project where the target system is a Class-1E safety related or mission critical system.

1.5 The ALS QA Plan will be referenced in the Project Management Plan together with the CM Plan, VV Plan, and Test Plan.

1.6 The ALS QA Plan is a platform specific QA plan and works under the umbrella of the CS Innovations 10CFR50 Appendix B compliant Quality Assurance Program (Reference 9000-00000).

1.7 The ALS technology is CS Innovations owned and controlled. 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 will span both the ALS board development itself and later integration into a system. The objective is for CS Innovations to be able 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 shows a graphical representation of these flows.

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2 Reference Documents

IEEE Std 730-1998 – "Standard for Software Quality Assurance Plans".

9000-00000 – "Quality Assurance Manual", CS Innovations, LLC

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3 Management

3.1 The Project Manager is responsible for general management, engineering and manufacturing efforts associated with an ALS project.

3.2 The ALS QA Manager must be identified in the Project Management Plan. The ALS QA Manager reports directly to the QA Manager.

3.3 The ALS QA Manager reports to the President/CEO, either directly or though the QA Manager.

3.4 The organizational structure and relationship of the QA program to the development organization is shown in Figure 2. CS Innovations is a small organization with a small management team. Therefore some activities which in larger organizations require a separate organization have been merged (e.g. Manufacturing and Engineering are under the Project Managers control). Roles and responsibilities of the functions associated with this plan are shown in Table 1.

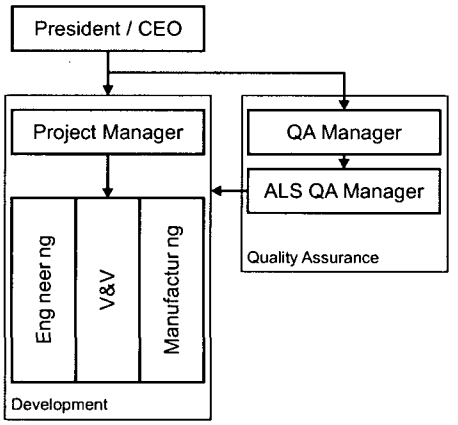

Figure 2: Relationship between organizational units

Table 1: Roles and Responsibilities

Roles	Responsibilities
Project Manager	Responsible for guiding project, managing resources, advocacy and customer interactions.
Systems Engineer	Define the system requirements. Decompose system requirements down to sub-system level. Maintain interfaces between sub-system and rest of system. Integrate the system. Define system-level testing
Electronics Designer	Derive requirements for board or chip level design. Design electronics to meet the requirements, using good engineering practices. Define internal interfaces between parts of the electronics. Consider system aspects that may affect the electronics, including noise and power distribution. Implement the design in hardware. Test the hardware. Implement corrections as necessary.
VV Engineer	Responsible overseeing all development activities including design, implementation and test. The VV engineer must maintain independence (i.e. can not have been involved in the creation of the item being reviewed). The VV Engineer will normally be involved in the testing by either performing oversight in the test activates or by performing the tests.

ALS QA Manager	Create/Maintain QA plan; Review subsystem requirements for proper decomposition from system requirements. Review design to verify requirements implemented, good engineering design practices followed. Assess implementation against the requirements and design. Ensure development and supporting processes (e.g. CM, VV, EQ) are in place and followed. Review choice of parts; Provide guidance on preferred parts. Ensure electronics are assembled/manufactured to acceptable standards. Perform or witness testing at various system and subsystem levels. Ensure all requirements are adequately verified.
ALS QA	The ALS QA Manager may assign other

3.5 All ALS development efforts within the scope of this document will be performed by personnel associated with the engineering team.

3.6 All QA efforts within the scope of this document will be performed by personnel associated with the QA team.

3.7 The goal of ALS QA is to assure the quality and safety of ALS by:

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3.8 ALS QA team must have close interaction with the development team, and not act as an external entity with only limited interaction with the project. In order to function effectively and meet its goals, ALS QA:

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3.9 The ALS QA Plan covers all 5 stages of the CS Innovation Life Cycle model, from "Planning" to "Installation". (Figure 3)

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4 Documentation

4.1 **Project Management Plan** – Describes management aspects of the project, such as organization, responsibilities, security aspects, project life cycle and schedule with milestones. The PM Plan must be reviewed by the ALS QA Manager before exiting the Planning stage.

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4.1.2 The PM Plan is created by the Project Manager.

4.1.3 The PM Plan must be reviewed for contractual and technical contents by the President, VV and the Customer before exiting the Planning stage.

4.1.4 The PM Plan must be updated by the Project Manager upon completion of each Project Life Cycle. If the update includes significant changes to content, the document must be redistributed for review according to the requirements in section 4.1 and 4.1.3.

4.2 **Test Plan** – Describes the planned scope, approach, resources and schedule for testing activities.

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4.3 **QA Plan** – this document.

4.3.1 The ALS QA Plan is maintained by the QA Manager.

4.3.2 The ALS QA Plan must be reviewed by the President on every revision change.

4.4 **VV Plan** – describes procedures, responsibilities and requirements for a comprehensive evaluation of the item being developed. The VV Plan must be reviewed by the ALS QA Manager before exiting the Planning stage and after each following update to the plan.

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4.5 **CM Plan** – describes the planned method for change control of Configuration Items throughout the project life cycle. The CM Plan must be reviewed by the ALS QA Manager before exiting the Planning stage.

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4.6 **EQ Plan** – The Environmental Qualification 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. The EQ Plan must be reviewed by the ALS QA Manager before exiting the Planning stage.

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4.7 **ALS Platform Specification** – The platform specification is the highest level description of the ALS Platform. It focuses on architectural aspects of the ALS design such as inter board communication, back plane connector definitions, mechanical constraints on the system and other general requirements to ALS boards.

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4.8 **ALS 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 Hardware Specification** – Is a detailed description of the ALS Hardware Design excluding the internal FPGA Design.

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4.10 **ALS FPGA Specification** – Is a detailed description of the ALS FPGA Design.

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5 Standards, Practices, Conventions, and Metrics

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6 Reviews and Audits

6.1 ALS QA maintains an ALS QA Report with updated information for ALS QA activates. The ALS QA Report follows the format defined by the CS Innovations QA Program (Reference 9000-00310).

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6.5 ALS QA shall perform in-process audits of the ALS development and related processes according to the procedures identified in this section. ALS QA shall plan and maintain audit schedules based on life cycle phases, the complex electronics products of each phase and past audit results.

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6.6 Design Data reviews are performed by ALS QA as a part of the design reviews or as a separate review verify compliance to the design and coding standards and to verify traceability to the requirements.

6.7 Managerial reviews

6.7.1 ALS QA shall attend scheduled project meetings in order to remain current on development status, activities, etc.

6.7.2 ALS QA attends Project Management reviews with the Project Manager to present and discuss the status of ALS QA activities.

6.8 Audit and Document Review Reports

6.8.1 Document reviews are performed each time an ALS document is released or revised.

7 Test

7.1 All testing of the ALS board are covered by the VV Plan and the Test Plan.

7.2 All Test Plan and Test Reports are reviewed by ALS QA.

8 Problem Reporting and Corrective Action

8.1 Audit findings and results are documented using the "Review Action Item" form, and by reference in the ALS QA Report. (Reference 9010-00004)

8.2 When performing in-process audits or reviews, minor issues or recommendations made by ALS QA may be tracked using a less formal problem tracking systems such as:

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8.3 ALS QA shall initiate a Corrective Action Request (Reference 9010-00035) to address audit noncompliance's and document review findings using the following process:

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9 Tools, Techniques, and Methodologies

No additional tools, techniques, or methodologies have been identified.

10 Code Control

10.1 Code control of development/engineering versions of design data are maintained in a separate project repository which full revision control. This will be covered by the ALS CM Plan. (Reference 6002-00002)

10.2 All released design data are reviewed and released according to CS Innovations' document control procedures (Reference 9000-00600).

11 Media Control

11.1 The methods and procedures used for media control are identified in the ALS CM Plan.

12 Supplier Control

12.1 Supplier control is implemented as defined by the CS Innovations Quality Manual, Reference 9000-00000. No additional supplier control is needed.

13 Records Collection, Maintenance, and Retention

13.1 All records are maintained according to CS Innovations' QA Program. (Reference 9000-01700).

14 Training

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15 Risk Management

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