


MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

March 7, 2007

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. David B. Matthews

Project No.0751
MHI Ref: UAP-HF-07035

Subject: A Summary Table Comparing U.S. and Japanese Quality Assurance Requirements for Nuclear Facilities

This letter supplements and summarizes the information forwarded to the U.S. Nuclear Regulatory Commission (NRC) by our letter dated January 26, 2007 (MHI Ref: UAP-HF-07003) which included a document providing a detailed comparison of the U.S. and Japanese QA requirements for nuclear facilities.

Enclosed, for the NRC staff's information, is a table summarizing and comparing these QA requirements. As can be seen from this table, the vast majority of requirements in 10 CFR 50, Appendix B, and ASME NQA1-1994, are very similar to the QA requirements in the equivalent Japanese guidelines. In fact for most QA criteria there are no significant differences. For those minor differences that do exist, the MHI QA Program for the US-APWR will ensure compliance with the requirements of 10 CFR 50, Appendix B.

Please do not hesitate to contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if there are additional questions regarding the MHI QA Program for the design of the US-APWR. His contact information is listed below.

Sincerely,



Masahiko Kaneda,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosure: A Summary Table Comparing U.S. and Japanese Quality Assurance Requirements for Nuclear Facilities (PQG-HD-19001 Rev.0)

CC: S. R. Monarque
L. J. Burkhart
C. K. Paulson

Contact Information

C. Keith Paulson, Senior Technical Manager
Mitsubishi Nuclear Energy Systems, Inc.
4350 Northern Pike, Suite 301
Monroeville, PA 15146
E-mail: ckpaulson@aol.com
Telephone: (412) 374 - 4063

D079
Add: Stephen Monarque

A Summary Table
Comparing U.S. and Japanese
Quality Assurance Requirements for
Nuclear Facilities

US-APWR

PQG-HD-19001 Rev.0

Mitsubishi Heavy Industries, LTD.
Nuclear Energy Systems Headquarters

Revision History

Revise		Approve	Review	Prepare	Page	Revision
No.	Date					
A Summary Table Comparing U.S. and Japanese Quality Assurance Requirements for Nuclear Facilities PQG-HD-19001						
0	2.27.07	<i>2/27/07</i> <i>[Signature]</i>	<i>2/27/07</i> <i>[Signature]</i>	<i>02/27/07</i> <i>S. Kamata</i>		New Issuance

10 CFR 50, Appendix B	ASME NQA-1- 1994	JEAG4101	Justification/Assessment of Differences ¹
Criterion I ORGANIZATION			
I-1 Establish and Execute a Quality Assurance Program			
a. Applicant is responsible for establishing and executing a Quality Assurance (QA) program	Persons or organizations responsible for assuring that an appropriate QA program has been established shall have sufficient authority.	The responsible organization is responsible to establish and implement a QA Program.	No significant difference
b. Allows delegation of the work of establishing and executing a QA program to others but the applicant shall retain the responsibility for it.	The individual(s) or organization(s) responsible for establishing and executing a QA program under this Standard may delegate any or all of the work to others but retain responsibility for it.	If the responsible organization delegates to other organizations it retains the responsibility for the effectiveness of the program.	No significant difference.
I-2 Delineate Authorities and Duties in Writing			
Authorities and duties for persons and organizations performing activities affecting the safety-related functions of structures systems and components shall be clearly delineated in writing.	The organizational structure, functional responsibilities, levels of authority, and lines of communication for activities affecting quality are documented.	The QA program includes organizational structure with defined functional responsibilities, levels of authority and interfaces for those managing, performing and assessing the adequacy of the work.	No significant difference.
I-3 Quality Assurance Functions Have Sufficient Authority and Freedom			
The persons and organizations performing QA functions shall have sufficient authority and organizational freedom to identify	Persons or organizations responsible for assuring that an appropriate QA program is established and verifying that	Management of independent assessment has sufficient authority and organizational freedom to carry out its responsibilities.	No significant difference

¹ The Proposed Standard Review Plan for Design Certification, Early Site Permit and New License Applications, Section 17.5, includes requirements in addition to those included in NQA-1 and JEAG4101, for example, QA review of quality-related design procedures. Since MHI has addressed additional commitments to these requirements as reflected in its QA Program Description, specific differences between NQA-1, JEAG and SRP requirements are not included herein.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
quality problems, to initiate, recommend, or provide solutions, and to verify implementation of solutions.	activities affecting quality are correctly performed have sufficient authority, access to work areas, and organizational freedom to: (a) identify quality problems; (b) initiate, recommend, or provide solutions to quality problems through designated channels; (c) verify implementation of solutions; and (d) assure that further processing, delivery, installation, or use is controlled until proper disposition of a nonconformance, deficiency, or unsatisfactory condition has occurred.		
I-4 Quality Assurance Function Reports to High Enough Level			
Persons and organizations performing QA functions report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided.	QA personnel or organizations report to a management level such that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations.	Senior management is responsible and accountable for planning, development, implementation and success of the QA program. The success of the QA program cannot and must not be delegated.	No significant difference. Senior Management is responsible and accountable at a high enough level.
I-5 QA has access to high enough line management level			
Individual(s) responsible for assuring effective execution of any	QA personnel or organizations have direct access to responsible	The JEAG Guideline does not specifically cover this because	No significant difference. For the US-APWR the QA Manager reports directly to the Executive Vice President.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
portion of the QA program at any location where activities subject to this appendix are being performed shall have direct access to such levels of management as may be necessary to perform this function.	management at a level where appropriate action can be effected.	Senior Management is responsible and accountable for the effective implementation of the QA program.	
II. QA Program			
II-1 Establish a QA Program early in the process			
Establish at the earliest practicable time, consistent with the schedule for accomplishing the activities, a QA program which complies with the requirements of this appendix.	The program is established at the earliest time consistent with the schedule for accomplishing the activities.	To promote QA it is important to program activities affecting quality before commencement.	No significant difference.
II-2 Written policies, procedures, instructions			
Document the QA program by written policies, procedures, or instructions and carry out the QA program throughout plant life in accordance with those policies, procedures, or instructions.	A documented QA program is planned, implemented, and maintained per this Part (Part I), or portions thereof.	Senior Management is to develop and issue a written QA policy statement reflecting the attainment and continuous improvement of quality. All work is accomplished using technical standards, instructions, procedures or other appropriate documents.	No significant difference.
II-3 Identify Systems Structures and Components, organizations and functions			
Identify the structures, systems, and components (SSCs) to be covered by the QA program, the organizations participating in the program and their	The program identifies the items to which it applies.	Nuclear safety is the fundamental consideration in the identification of items, services and processes to which the QA program applies. A graded approach is allowed.	Significant difference. MHI achieves compliance by committing, for the US-APWR, to R.G. 1.26, R.G.1.29, for Quality Group Classifications and seismic design classification, For important non-safety related systems, MHI has additionally committed to

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
designated functions.			R.G. 1.155 Station Black-out, R.G. 1.189 Fire Protection, and G.L. 85-06 ATWS.
II-4. QA Program controls activities			
The QA program provides control over activities affecting the quality of the identified SSCs, to an extent consistent with their importance to safety.	The program identifies the activities to which it applies. The establishment of the program includes consideration of the technical aspects of the activities affecting quality. The program provides control over activities affecting quality to an extent consistent with their importance.	The performance grade of QA activity of each item, service or process is identified according to the relative importance to nuclear safety. The graded approach shall reflect a planned and recognized difference in the applications of specific QA requirements.	No significant difference. Also see above.
II-5 Activities are accomplished in suitable environment			
Accomplish activities affecting quality under suitably controlled conditions.	The program provides for the planning and accomplishment of activities affecting quality under suitably controlled conditions.	Work is performed under controlled conditions using approved current instructions, procedures, drawings or other appropriate means.	No significant difference.
II-6 Consider special controls, processes, test equipment			
The QA program accounts for special controls, processes, test equipment, tools, and skills to attain the required quality, and the need for verification of quality by inspection and test.	The program provides for any special controls, processes, test equipment, tools, and skills to attain the required quality and for verification of quality.	Work is performed under controlled conditions using approved current instructions, procedures, drawings or other appropriate means. Facilities equipment and jigs used for process monitoring, data collection, inspections and tests is of the proper range, accuracy, type and precision.	No significant difference.
II-7 Personnel are indoctrinated and trained			
Provide	The program	Personnel are	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.	provides for indoctrination and training, as necessary, of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained.	trained and qualified so that they are competent to perform their assigned work and understand the nuclear safety and safety consequences of their activities.	
	NQA-1 includes Supplemental Requirements (2S-1 – 2S-4) For qualification of Inspection and Test, Non-Destructive Examination, and Audit Personnel and Indoctrination and Training of Personnel.	JEAG specifies the qualification of inspector in testing such as destructive testing.	No impact. MHI will achieve compliance for the US-APWR by implementing its commitment to the NQA-1 Supplements 2S-1, 2S-3, and 2S-4. 2S-2 is not applicable to Design Certification Applications. This is reflected in section 2 of the MHI QA Program description.
II-8 QA Program is reviewed regularly			
a. The applicant shall regularly review the status and adequacy of the QA program.	It is specified that the adequacy of the QA program shall be regularly assessed and effective implementation shall be assured.	Management does a traditional audit/appraisal to determine the adequacy and extent of QA program implementation. In addition, Management does a self-assessment which goes beyond conformance to regulations, standards and procedures.	JEAG has broader expectations.
b. Management of other organizations participating in the QA program regularly review the status and adequacy of that part of the QA program which they are executing.	Management of those organizations implementing the QA program, or portions thereof, regularly assesses the adequacy of that part of the program for which they are responsible and	Management audit/appraisal and self assessment apply to all levels of management.	JEAG has broader expectations.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
	assure its effective implementation.		
III Design Control			
III-1. Regulatory requirements are translated into design documents			
Establish measures to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the application, for those SSCs to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.	The design is defined, controlled, and verified. Applicable design inputs are appropriately specified on a timely basis and correctly translated into design documents. Applicable design inputs, such as design bases, performance requirements, regulatory requirements, codes, and standards, are identified and documented, and their selection reviewed and approved by the responsible design organization.	Design procedures are established to incorporate design requirements into design documents properly. Design is carried out in accordance with established engineering codes and standards and incorporates applicable requirements and design bases. Design inputs are correctly translated into design outputs. Design inputs include all requirements for design, such as technical bases, performance, security, safety and reliability requirements. Design outputs include specifications, drawings, procedures and instructions.	No impact. JEAG does not specify "regulatory" requirements as a design input but does include requirements as design input. MHI will achieve compliance for the US-APWR by specifying regulatory requirements as a design input. This is reflected in section 3 of the MHI QA Program description.
III-2 Quality standards are translated into design documents			
Measures include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled.	Appropriate quality standards are identified and documented, and their selection reviewed and approved. Changes from specified quality standards, including the reasons for the changes, are identified, approved,	See above Design changes are subject to configuration and design control measures and approved by the original designer or a technically qualified alternate.	No impact. JEAG does not specify "quality" standards as a design input but does include requirements as design input. MHI will achieve compliance for the US-APWR by specifying design standards as a design input. This is reflected in section 3 of the MHI QA Program Description.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
	documented, and controlled.		
III-3 Materials, equipment, and processes are suitable for the application			
Establish measures for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the SSCs.	Materials, parts, equipment, and processes that are essential to the function of the SSC are selected and reviewed for suitability of application.	Not specifically addressed.	No impact.. MHI will achieve compliance by establishing measures consistent with Appendix B and NQA-1. This is reflected in section 3 of the MHI QA Program Description.
III-4 Design interfaces are identified and coordinated			
Establish measures for the identification and control of design interfaces and for coordination among participating design organizations.	Design interfaces are identified and controlled. Design efforts are coordinated among participating organizations.	Design interfaces are identified and controlled. Interfaces among all organizations involved in the design are identified, coordinated and controlled.	No significant difference.
III-5 Design interfaces are controlled by procedure			
Measures include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces.	Interface controls include the assignment of responsibility and the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces. Design information transmitted across interfaces is documented and controlled.	Interfaces are controlled by assigning responsibilities, and establishing procedures among participating internal and external organizations.	No significant difference.
III-6 Design is checked and verified			
Design control measures provide for verifying or checking the	Design control measures are applied to verify the adequacy of	Design verification methods include design review, alternate	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
adequacy of design, such as by design reviews, alternate or simplified calculations, or a suitable testing program.	design, such as by one or more of the following: the performance of design reviews, the use of alternate calculations, or the performance of qualification tests.	calculation, and qualification testing.	
		JEAG 1993 version includes methods (with controls) not specifically included in NQA-1.	No impact. MHI will review applicable verification tests to ensure reasonable assurance of compliance with current U.S. requirements. See MHI QA Program Description section 2.6
III-7 Checking and verification is independent			
The verifying or checking process is performed by individuals or groups other than those who performed the original design, but who may be from the same organization.	Design verification shall be performed by any competent individual(s) or group(s) other than those who performed the original design but who may be from the same organization.	Verification is performed by individuals other than those who performed the design (but who may be from the same organization).	No significant difference
III-8 Tests are done under the most adverse conditions			
A test program used to verify the adequacy of a specific design feature in lieu of other verifying or checking processes, includes suitable qualification testing of a prototype unit under the most adverse design conditions.	Where design adequacy is to be verified by qualification tests, the tests are identified. The test configuration is clearly defined and documented. Testing demonstrates adequacy of performance under conditions that simulate the most adverse design conditions.	Test used to verify or validate design features are conducted under conditions simulating the most adverse conditions.	No significant difference.
III-9 Minimum design control scope: (Reactor physics, stress analyses, thermal, hydraulic, materials analyses, materials evaluations, ISI access, test acceptance criteria selection)			
Apply design control measures to items such as	The responsible design organization prescribes and	Design requirements, inputs, processes,	No impact. The JEAG does not specify the level of detail included in

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
<p>the following: reactor physics, stress, thermal, hydraulic, and accident analyses; compatibility of materials; accessibility for in-service inspection, maintenance, and repair; and delineation of acceptance criteria for inspections and tests.</p>	<p>documents the design activities on a timely basis and to the level of detail necessary to permit the design process to be carried out in a correct manner, and to permit verification that the design meets requirements. Design documents are adequate to support facility design, construction, and operation.</p>	<p>outputs, changes, records and organizational interfaces are controlled.</p>	<p>Appendix B or NQA-1. MHI will achieve compliance by establishing measures consistent with Appendix B and NQA-1. This is reflected in section 3 of the MHI QA Program Description.</p>
<p>III-10 Design changes are controlled as original</p>			
<p>Design changes, including field changes, are subject to design control measures commensurate with those applied to the original design and are approved by the organization that performed the original design unless the applicant designates another responsible organization.</p>	<p>Design changes, including field changes, are governed by control measures commensurate with those applied to the original design. Changes are approved by the original designer unless the Owner or his designee designates a new responsible organization having demonstrated competence in the specific design area of interest and an adequate understanding of the requirements and intent of the original design.</p>	<p>Design changes are subject to the same design control measures as those applied to the original design. Design changes are subject to configuration and design control measures and approved by the original designer or technically qualified alternate.</p>	<p>No significant difference.</p>
<p>IV. Procurement Document Control</p>			
<p>IV-1 Procurement documents reflect design basis and regulatory requirements</p>			
<p>Establish measures to assure that applicable regulatory requirements, design bases, and other requirements</p>	<p>Applicable design bases and other requirements necessary to assure adequate quality are included or referenced in</p>	<p>Requirements necessary to ensure the quality of items and services are developed and specified in the</p>	<p>No significant difference.</p>

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
<p>which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services, whether purchased by the applicant or by its contractors or subcontractors.</p>	<p>documents for procurement of items and services. Technical requirements are specified by reference to specific drawings, specifications, codes, standards, regulations, procedures, or instructions. The procurement documents provide for identification of test, inspection, and acceptance requirements of the Purchaser for monitoring and evaluating the Supplier's performance.</p>	<p>procurement documents. Procurement documents include acceptance criteria and invoke applicable technical and administrative requirements including specifications, codes, standards, tests and inspection requirements.</p>	
<p>IV-2 Procurement documents reflect quality assurance program requirements</p>			
<p>To the extent necessary, procurement documents require contractors or subcontractors to provide a QA program consistent with the pertinent provisions of this appendix.</p>	<p>To the extent necessary, procurement documents require Suppliers to have a QA program consistent with the applicable requirements of this Part (Part I).</p>	<p>Contents of procurement documents include quality assurance standards. (93 version included provisions for submission of a QA program.)</p>	<p>No significant difference.</p>
	<p>NQA-1 includes Supplemental Requirements (4S-1) Spare and Replacement Parts</p>	<p>Not included.</p>	<p>Not applicable to the design certification stage. MHI commits to Supplement 4S-1 in section 4 of its QA Program Description.</p>
<p>V Instructions Procedures and Drawings</p>			
<p>V-1 Quality activities are performed to procedures, instructions and drawings</p>			
<p>Activities affecting quality are prescribed by documented instructions, procedures, or drawings, of a type appropriate to the</p>	<p>Activities affecting quality are prescribed by and performed in accordance with documented instructions, procedures, or</p>	<p>Work is performed under controlled conditions using approved current instructions, procedures, drawings or other appropriate means.</p>	<p>No significant difference.</p>

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
circumstances and are accomplished per these instructions, procedures, or drawings.	drawings of a type appropriate to the circumstances.		
V-2 Acceptance criteria are specified in procedures, instructions and drawings			
Instructions, procedures, or drawings include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.	Instructions, procedures, or drawings of a type appropriate to the circumstances include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished.	All work is accomplished using technical standards, instructions, procedures or other appropriate documents. Documents that govern work processes and activities are of a detail commensurate with the complexity and importance of the work. Inspection and testing of specified items, services and processes is conducted using established acceptance and performance criteria. The level of inspection and testing and the degree of independence of personnel is established.	No significant difference
VI Document Control			
VI-1 Documents are reviewed, approved, released and distributed			
Establish measures to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. Measures	The preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality shall be controlled to assure that correct documents are being	Documents such as procedures, instructions, specifications and drawings, or other media which describe processes, specify requirements, or establish design are prepared,	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
<p>assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed.</p>	<p>employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel.</p>	<p>reviewed, approved, issued, distributed, authorized, revised, and as required, validated.</p>	
<p>VI-2 Changes follow same the process as original</p>			
<p>Changes to documents are reviewed and approved by the same organizations that performed the original review and approval unless the applicant designates another responsible organization.</p>	<p>Major changes to documents are reviewed and approved by the same organizations that performed the original review and approval unless other organizations are specifically designated.</p>	<p>Revisions to controlled documents are reviewed and approved by a design organization or a qualified and knowledgeable person. Design changes are approved by the original organization or a technically qualified alternate.</p>	<p>No significant difference.</p>
<p>VII Control of Purchased Material</p>			
<p>VII-1 Assure purchased material, services, or equipment meets requirements</p>			
<p>Establish measures to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. Measures include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or</p>	<p>The procurement of items and services is controlled to assure conformance with specified requirements. Such control provides for the following as appropriate: source evaluation and selection, evaluation of objective evidence of quality furnished by the Supplier, source inspection, audit, and examination of items or services upon delivery or</p>	<p>Procured items and services meet established requirements and perform as specified. Suppliers are evaluated and selected on the basis of specified criteria. Evidence that purchased items and services meet procurement requirements is available before use. Procurement process includes supplier evaluation and periodic monitoring, source verification, receipt</p>	<p>No significant differences.</p>

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery	completion.	inspection, certificates of conformance.	
VII-2 Documented evidence is available at licensee			
Documentary evidence that material and equipment conform to the procurement requirements is available at the site.	Activities verifying conformance to requirements of procurement documents are recorded. Source surveillances and inspections, audits, receiving inspections, non-conformances, dispositions, waivers, and corrective actions are documented.	Records that describe status, configuration, and characteristics of items and services describe the performance of processes and represent objective evidence of quality are specified, prepared, reviewed, approved and maintained.	No significant difference.
VII-3 Documented evidence is retained			
Documentary evidence is retained at the site.	The applicable procurement documents specify the records to be generated, supplied, and maintained by or for the Owner.	A records system is established to provide for the identification, collection, indexing, filing, storing, maintenance, retrieval and disposal of records. Retention times of records and associated test materials and specimens are established to be consistent with the type of records, material and specimens involved.	No significant difference.
VII-4 Documented evidence is of sufficient detail			
Documentary evidence is sufficient to identify the specific requirements, such as codes, standards, or	Documents that are designated to become records shall be legible, accurate, and completed appropriate to the	Evidence that purchased items and services meet procurement requirements is available before use.	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
specifications, met by the purchased material and equipment.	work accomplished.		
VII-5 Supplier QA effectiveness is assessed periodically			
The effectiveness of the control of quality by contractors and subcontractors is assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services.	The Purchaser of items and services establishes measures to interface with the Supplier and to verify Supplier's performance as deemed necessary by the Purchaser.	Procurement process includes supplier evaluation and periodic monitoring, source verification, receipt inspection, certificates of conformance.	No significant difference.
	NQA-1 Supplement 7S-1 includes requirements regarding Certificate of Conformance details and Commercial grade item dedication.	Not included.	No impact. MHI has committed to Supplement 7S-1 in section 7 of the QA Program Description.
VIII Control of Material, Parts, Components			
Not Applicable to Design Certification Applications			
IX Special Processes			
Not Applicable to Design Certification Applications			
X Inspection			
X-1 Program for inspection of activities			
A program for inspection of activities affecting quality is established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity.	Inspections required to verify conformance of an item or activity to specified requirements shall be planned and executed. Characteristics to be inspected and inspection methods to be employed shall be specified. Inspection results shall be documented.	Inspection and testing of specified items, services, and processes are conducted using established acceptance and performance criteria. The level of inspection and testing is established. A process is established to specify when and what type of inspection is to be performed for the types of work to be	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
		inspected. Inspection types include source, in-process, final, and receipt. Inspection planning includes item characteristics and inspection techniques. Records that represent objective evidence of quality are specified, prepared, reviewed, approved and maintained.	
X-2 Inspection by other than performer			
Inspections are performed by individuals other than those who performed the activity being inspected.	Inspection for acceptance is performed by persons other than those who performed or directly supervised the work being inspected.	Personnel performing the work do not inspect their own work for acceptance. Personnel responsible for performing acceptance inspections are technically competent.	No significant difference.
X-3 Inspections for each work operation			
Examinations, measurements, or tests of material or products processed are performed for each work operation where necessary to assure quality.	Inspect items in-process for those work activities necessary to verify quality. If inspection of processed items is impossible or disadvantageous, indirect control by monitoring of processing methods, equipment, and personnel is done. Inspection and process monitoring are performed systematically to assure specified requirements and quality are being achieved	Inspection types include in-process. Planning process addresses work processes and witness and hold points. Controls preclude inadvertent bypassing of required inspections.	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
	throughout the process.		
X-4 Control methods if end product can't be inspected			
Provide indirect control by monitoring processing methods, equipment, and personnel if inspection of processed material or products is impossible or disadvantageous. Both inspection and process monitoring are provided when control is inadequate without both.	Controls, where required, are established and documented for the coordination and sequencing of these activities at established inspection points during successive stages of the conducted process. Both inspection and process monitoring shall be provided when control is inadequate without both.	When it is impossible to inspect after manufacturing assembling or installation, indirect inspection such as manufacturing method, equipment, or worker control is provided.	No significant difference.
X-5 Specify hold points			
If mandatory inspection hold points, which require witnessing or inspecting by the applicant's designated representative and beyond which work shall not proceed without the consent of its designated representative are required, the specific hold points are indicated in appropriate documents.	If mandatory inspection hold points are required beyond which work shall not proceed without the specific consent of the designated representative, the specific hold points are indicated in appropriate documents. Consent to waive specified hold points is recorded prior to continuation of work beyond the designated hold point.	Planning process addresses work processes and witness and hold points. Administrative controls, such as hold points and status indicators are used to preclude the bypassing of required inspections and tests.	No significant difference.
XI Test Control			
XI-1 Program to identify and perform tests			
A test program is established to assure that all testing required to demonstrate that SSCs will perform	Tests required to verify conformance of an item or computer program to specified	Testing of specified items and processes is conducted using established acceptance and	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
satisfactorily in service is identified	requirements and to demonstrate satisfactory performance for service are planned and executed. Characteristics to be tested and test methods are specified. Test results are documented and their conformance with acceptance criteria are evaluated.	performance criteria. Appropriate tests are conducted to demonstrate that items and processes will perform as intended. Planning addresses item characteristics, test methods, and acceptance criteria.	
XI-2 Written test procedures			
Tests are performed per written test procedures.	Test procedures include or reference test objectives and provisions for assuring that prerequisites for the given test have been met	Test procedures are required to be developed and followed.	No significant difference.
XI-3 Acceptance criteria per design			
Test procedures incorporate the requirements and acceptance limits contained in applicable design documents.	Test requirements and acceptance criteria are based upon specified requirements contained in applicable design or other pertinent technical documents.	Test procedures incorporate acceptance criteria. Test acceptance criteria are provided by the original design organization or technically competent and knowledgeable alternative.	No significant difference.
XI-4 Types of tests: proof tests, prototype tests, qualification tests, production tests			
The test program includes, as appropriate, proof tests prior to installation, of SSCs.	Required tests include as appropriate, prototype qualification tests, production tests, and proof tests prior to installation.	Test process includes bench tests, proof tests, prototype qualification tests, performance tests.	No significant difference.
XI-5 Test prerequisites – instrumentation, test environment			
Test procedures include provisions	Test procedures include provisions	Test procedures cover prerequisites,	No impact. Except for the differences

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and used, and that the test is performed under suitable environmental conditions.	for assuring that prerequisites for the given test have been met: adequate instrumentation is available and used, necessary monitoring is performed, and suitable environmental conditions are maintained. Prerequisites shall include the following, as applicable: calibrated instrumentation, appropriate equipment, trained personnel, condition of test equipment and the item to be tested, suitable environmental conditions, and provisions for data acquisition.	technical and safety instructions, completeness and accuracy of test data, use and type of test equipment and data recording devices, calibration data, establishment of hold points, test configuration and acceptance criteria. JEAG 1993 specified test performed by "suitable" personnel. JEAG 1993 specifies calibration and control of measuring instruments and test equipment for the condition of test equipment. JEAG 1993 did not specifically address "condition of test equipment".	between JEAG 1993 and NQA-1, there are no significant differences. MHI will review previous verification tests to ensure reasonable assurance of compliance with current U.S. requirements. See MHI QA Program Description section 2.6
XI-6 Results documented			
Test results are documented.	Test records identify, as a minimum: (a) item tested (b) date of test (c) tester or data recorder (d) type of observation (e) results and acceptability (f) action taken in connection with any deviations noted (g) person evaluating test results	Test records include: Test procedures Test items Test date and time Equipment and its calibration Test performer or data collector Results and their conformity Measures taken for non-conformity Person who evaluated results	No significant difference
XI-7 Results evaluated			
Test results are evaluated to assure	Test results are evaluated by a	Test results are documented and	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
that test requirements have been satisfied.	responsible authority to assure that test requirements have been satisfied	evaluated to ensure test requirements have been met.	
	NQA-1 Supplement 11S-2 for Computer Program Testing and NQA-1 Part –II Subpart 2.7 QA Requirements of Computer Software for Nuclear Facility Applications	JEAG 1993 did not specifically address computer program testing.	No impact. MHI has committed to Supplement 11S-2 and Part-II subpart 2.7 in section 11 of the QA Program Description
XII. Control of Measuring and Test Equipment			
XII-1 Tools, gauges, instruments, measuring and testing devices			
Establish measures to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits	Tools, gages, instruments, and other measuring and test equipment used for activities affecting quality are controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits.	Facilities equipment and jigs used for process monitoring, data collection, inspections and tests is of the proper range, accuracy, type and precision. Tools, gauges, measuring instruments and other measurement test equipment which is used to determine item condition and conformity of items and services is used with adequate range, type, correctness and accuracy. Selection, identification, calibration requirements, and calibration frequency of all measuring and test devices used to determine item quality and operation condition is specified.	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
XIII Handling Storage & Shipping			
Not Applicable to Design Certification Applications			
XIV Inspection, Test, and Operating Status			
Not Applicable to Design Certification Applications			
XV Nonconforming Materials Parts or Components			
XV-1 Control of nonconforming items			
a. Establish measures to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation.	Items that do not conform to specified requirements are controlled to prevent inadvertent installation or use.	Non-conforming items are properly controlled to prevent their inadvertent test, installation, and use. Items, services and processes that do not meet specified requirements are identified and the safety impact of the non-conformances assessed and reported to the appropriate level of management in order to prevent from careless usage or acceptance of non-conformance items.	No significant difference.
b. Measures include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations.	Controls provide for identification, documentation, evaluation, segregation when practical, and disposition of nonconforming items, and for notification to affected organizations.	Items, services and processes that do not meet specified requirements are identified. Line managers establish and implement measures to identify, document, classify, analyze, correct, eliminate and follow up activities, items, services or processes that do not meet established requirements and goals or do not result in anticipated quality. Management ensures that those performing work	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
		<p>are aware of and use the process for prompt notification and reporting of non-conformances. Control methods for non-conformances take into consideration: Marking, Tagging, Segregation, Marking and tagging ensure content is consistent with the non-conformance report, status is clear, it is clear who is authorized to change the status, and restrictions on the use. Segregation ensures item is not used before approved corrective action is taken. Segregation is achieved by removal to a secure area, placing behind barriers, isolating the non-conforming item, or stopping service or process, or by administrative control.</p>	
XV-2 Review nonconforming items			
<p>Nonconforming items are reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures.</p>	<p>Nonconforming characteristics are reviewed and recommended dispositions of nonconforming items are proposed and approved in accordance with documented procedures. The disposition, such as use-as-is, reject,</p>	<p>The disposition for non-conforming items and services is decided according to established procedures after evaluating their influence on nuclear safety. Non-conforming items are reviewed and accepted,</p>	<p>No significant difference.</p>

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
	repair, or rework, of nonconforming items are identified and documented.	rejected, repaired or reworked.	
	NQA-1 Supplement 15S-1 includes personnel qualification requirements for personnel dispositioning non-conformances.	JEAG 2000 has similar requirements but JEAG 1993 does not have explicit requirements.	No impact. MHI has committed to NQA-1 Supplement 15S-1 in section 15 of its QA Program Description.
XVI. Corrective Action			
XVI-1 Conditions Adverse to Quality are identified and corrected			
Establish measures to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.	Conditions adverse to quality are identified promptly and corrected as soon as practical.	Items, services and processes that do not meet specified requirements are identified and the safety impact of the non-conformances assessed and reported to the appropriate level of management in order to prevent from careless usage or acceptance of non-conformance items. Non-conforming items are properly controlled to prevent their inadvertent test, installation and use. They are reviewed and either accepted, rejected, repaired or reworked.	No significant difference.
XVI-2 Significant Conditions Adverse to Quality - the cause is identified and action is taken to prevent recurrence			
Measures assure for significant conditions adverse to quality that the cause of the condition is determined and corrective action is taken to preclude repetition.	In the case of a significant condition adverse to quality, the cause of the condition is determined and corrective action taken to preclude recurrence.	To ensure improvement, the causes of such non-conformances are determined and action taken to prevent their recurrence. Line managers establish and implement	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
		measures to identify, document, classify, analyze, correct, eliminate and follow up activities, items, services or processes that do not meet established requirements and goals or do not result in anticipated quality.	
XVI-3 Significant Conditions Adverse to Quality are documented and reported to management			
The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken are documented and reported to appropriate levels of management.	The identification, cause, and corrective action for significant conditions adverse to quality are documented and reported to appropriate levels of management.	Items, services and processes that do not meet specified requirements are identified and the safety impact of the non-conformances assessed and reported to the appropriate level of management in order to prevent from careless usage or acceptance of non-conformance items. JEAG 1993 specifically includes "Causes of non-conformances and corrective action to prevent recurrence is reported to concerned organizations." Management responsibilities in JEAG 2000 are more broadly defined but do not specifically address reporting cause and corrective actions to management for significant conditions.	No impact. MHI QA Program Description section 16 requires "In the case of significant conditions adverse to quality, the cause is determined and actions to preclude recurrence are taken and reported to management."

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
XVII QA Records			
XVII-1 Maintain records of evidence of quality activities			
Sufficient records are maintained to furnish evidence of activities affecting quality.	Records that furnish documentary evidence of quality are specified, prepared, and maintained. Records are protected against damage, deterioration, or loss.	A records system is established and implemented to ensure that sufficient records are specified, prepared, reviewed, approved and maintained to reflect completed work accurately.	No significant difference.
XVII-2 Records include reviews inspections, tests, audits, work performance monitoring, materials analysis			
The records include at least the following: the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses.	Applicable design specifications, procurement documents, test procedures, operational procedures, or other documents specify the records to be generated, supplied, or maintained by or for the Owner.	Records of design, procurement, inspection, testing, and training are typically required. Retention times of records and associated test materials and specimens are established to be consistent with the type of records, material and specimens involved. Records that describe status, configuration, and characteristics of items and services describe the performance of processes and represent objective evidence of quality are specified, prepared, reviewed, approved and maintained.	No significant difference. Audits and monitoring of work performance are not specifically mentioned in the JEAG. MHI QA Program Description section 17 commits to NQA-1 Basic Requirement 17 and Supplement 17S-1.
XVII-3 Records include qualifications of personnel, procedures and equipment data			
The records include closely-related data such as qualifications of personnel, procedures, and	See above.	Records relating to personnel and records that describe status, configuration, and characteristics of	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
equipment.		items and services describe the performance of processes and represent objective evidence of quality are specified, prepared, reviewed, approved and maintained. Records of training and procedures are maintained.	
XVII-4 Inspection & Test Record Content			
Inspection and test records, as a minimum, identify the inspector or data recorder, the type of observation, the results, the acceptability, and the action taken in connection with any deficiencies noted.	Test/Inspection records identify, as a minimum: (a) item tested/inspected (b) date of test/inspection (c) tester or data recorder/inspector (d) type of observation (e) results and acceptability (f) action taken in connection with any deviations noted (g) person evaluating test results	Test records include: Test procedures Test items Test date and time Equipment and its calibration Test performer or data collector Results and their conformity Measures taken for non-conformity Person who evaluated results Information to be included in each inspection and test program: record format for each inspection and test.	No impact. JEAG is specific regarding test reports, but not as specific regarding inspection reports. NQA-1 Supplement 10S-1 specifies inspection record contents. MHI has committed to NQA-1 Supplement 10S-1 in section 10 of the MWHI QA Program Description.
XVII-5 Records are Identifiable and Retrievable			
Records are identifiable and retrievable.	Records are legible, identifiable, and retrievable.	A records system is established to provide for the identification, collection, indexing, filing, storing, maintenance, retrieval and disposal of records.	No significant difference.
XVII-6 Record retention requirements are established, i.e., duration, location, responsibility			
Consistent with applicable regulatory requirements, establish requirements concerning record	Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition are	A records system is established and implemented to ensure that sufficient records are specified, prepared,	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
retention, such as duration, location, and assigned responsibility.	established and documented.	reviewed, approved and maintained to reflect completed work accurately. The QA program addresses both permanent and non-permanent records and defines their respective retention times. Storage facilities for records are maintained.	
	NQA-1 Supplement 17S-1 specifies provision for the storage facility, offers two options, a single facility and a dual facility, includes temporary storage requirements, and retrieval requirements	JEAG1993 does not specifically address dual storage facilities. On the other hand, JEAG2000 specifies appropriate retention condition of quality records in the separate facilities.	No impact. MHI QA Program Description section 17 includes a commitment to Supplement 17S-1.
XVIII Audits			
XVIII-1 Perform audits			
A comprehensive system of planned and periodic audits is carried out to verify compliance with all aspects of the QA program and to determine the effectiveness of the QA program.	Planned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness.	Management establishes and implements a process of independent assessments. A system of planned and documented internal and external audits is carried out to assess the adequacy and effectiveness of the QA program. Independent assessments are conducted on behalf of management to measure effectiveness of management processes and the adequacy of work	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
		performance, to monitor item or service quality and to promote improvement. Independent assessments consist of audits, reviews, checks, and other methods.	
XVIII-2 Use a written procedure			
The audits are performed in accordance with the written procedures or check lists.	These audits are performed in accordance with written procedures or checklists	An assessment plan is established aimed at assessment activities and requirements of assessment. Included in the plan are: subject of assessment, scope, check list, procedures.	No significant difference.
XVIII-3 Use trained personnel			
The audits are performed by appropriately trained personnel.	Supplement 2S-3 Provides qualification requirements for audit personnel.	JEAG does not specify qualifications for audit personnel	No impact. MHI QA Program Description section 2 commits to Supplement 2S-3 Supplementary Requirements for the Qualification of QA Program Audit Personnel.
XVIII-4 Use personnel not responsible for audited area			
The audits are performed by personnel not having direct responsibilities in the areas being audited.	These audits are performed by personnel who do not have direct responsibility for performing the activities being audited.	Persons conducting independent assessments shall not participate directly in the work being assessed.	No significant difference.
XVIII-5 Document audit results			
Audit results are documented.	Audit results are documented.	Assessment results are reported clearly and promptly. The assessment report communicates findings quickly. The team leader is responsible for preparing and submitting the report. The report includes	No significant difference.

Summary Comparison of ASME NQA-1-1994 and JEAG4101

10 CFR 50, Appendix B	ASME NQA-1-1994	JEAG4101	Justification/Assessment of Differences ¹
		a summary statement on whether the activities assessed were satisfactory or not.	
XVIII-6 Management reviews audit results			
Audit results are reviewed by management having responsibility in the area audited.	Audit results are reported to and reviewed by responsible management.	The assessed organization is provide with the final report and confirms the contents of it. The assessed organization reviews and investigates findings to determine corrective action.	No significant difference.
XVIII-7 Action is taken where indicated			
Follow-up action, including re-audit of deficient areas, is taken where indicated.	Follow-up action is taken where indicated.	The assessed organization reviews and reports on progress achieved in completing corrective actions so senior management is aware of the status. The assessment unit and the assessed organization follow up on the corrective actions.	No significant difference.