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Assessment Document

Comparison of 10CFR50 Appendix B and ASME NQA-1-1994 Requirements Versus CSA N286 Series of Standards

ACR USA

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Revision 0

2003 February Fevrier 2003

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1. STATEMENT OF PURPOSE

The purpose of this document is to provide a comparison of the Canadian CSA N286 series of standards versus US NRC 10CFR50, Appendix B and ASME NQA-1-1994 standard and an assessment of the impact of differences, if any, on the ACR QA program and their proposed disposition. The selection of ASME NQA-1-1994 instead of the latest NQA-1-2000 is made based on discussions with US NRC.

Section 2 of this document provides method of comparison. Section 3 provides a summary of major differences with respect to standards writing approach, structure, scope, requirements and assessment of differences on the Advanced CANDU Reactor (ACR) QA program and the required actions. Section 4 provides a detailed Comparison Table.

2. METHOD OF COMPARISON

The Comparison Table (Section 4) provides a comparison of the requirements of the 10CFR50 Appendix B and ASME NQA-1-1994 versus the requirements of CSA N286 series of standards. Since the CSA N286 series of standards, and particularly CSA N286.1, Procurement Quality Assurance for Nuclear Power Plants, refers to the Canadian CSA Z299 series of standards for manufacturing and testing, this comparison also makes use of the CSA Z299 series of standards, as appropriate. The scope of the comparison in the Comparison Table is limited to the elements of the QA program requirements as defined in 10CFR50, Appendix B and as applicable to ACR Design Certification. The following parts of ASME NQA-1-1994 with corresponding requirements in the CSA N286 series of standards are not included:

- Part II: Quality Assurance Requirements for Nuclear Facility Applications;
- Part III: Non-mandatory Appendices.

For this comparison, ASME NQA-1-1994 is used as the reference document. Therefore, the clauses and paragraphs of other documents are aligned with the requirements stated in ASME NQA-1-1994. For example, the text of 10CFR50 Appendix B in the Comparison Table is not in the same order as it appears in the original document.

3. SUMMARY OF MAJOR DIFFERENCES

3.1 Difference in Standards Writing Approach

One fundamental difference between the CSA N286 series of standards and ASME NQA-1-1994 is in the approach as follows:

The CSA N286 series is a set of industry consensus standards reflecting currently recommended Canadian best practices. The CSA N286 series of standards is based on a set of 16 Management Principles to Achieve Quality. The Canadian Nuclear Safety Commission participates as an equal member in this consensus process. It prescribes compliance with these standards as a condition of granting construction, commissioning, or operating licences.

Whereas, ASME NQA-1-1994, an industry consensus standard, contains 18 criteria aligned with those addressed in 10CFR50 Appendix B. It reflects industry practices and processes for meeting the requirements. One of this standard's objectives is to obtain endorsement by regulatory bodies as meeting the respective QA Regulations.

3.2 Difference in Structure

The ASME NQA-1-1994 standard applies to all phases of a nuclear facility's life cycle and to both the owner of the facility and any participants in the project. The CSA N286 standards represent a series of documents where CSA N286.0 is the standard addressed to the owner of the nuclear power plant defining the overall quality assurance program requirements. The CSA N286 sub-tier standards provide detailed quality assurance requirements for each of the major phases of a nuclear power plant life cycle, including procurement, design, construction, commissioning, and operation. Figure 1 illustrates the hierarchy and relationship among the CSA N286 series of standards. In addition to the sub-tier standards addressing QA requirements for the major life cycle phases illustrated in Figure 1, the CSA N286 series of standards also includes CSA N286.7, Quality Assurance of Analytical, Scientific, and Design Computer Programs for Nuclear Power Plants. CSA N286.7 standard specifies requirements for the design, development, and use of analytical, scientific, and design computer programs. It is designed to complement the QA program requirements in any of the other CSA N286 sub-tier standards. It is required to be used in combination with the appropriate sub-tier standard in order to define the complete QA program requirements for a particular nuclear power plant life cycle phase.

The ASME NQA-1-1994 standard contains 18 main clauses that are modelled after the 18 criteria of 10CFR50, Appendix B. Each of these main clauses contains Basic Requirements. Additional detailed requirements are included as mandatory Supplements for each of these clauses. The CSA N286 series of standards is designed so that each sub-tier standard can be used as a stand-alone document without having to refer to CSA N286.0 or any other sub-tier standard.

3.3 Difference in Scope

ASME NQA-1-1994 includes in its scope the activities related to siting of a nuclear facility. The CSA N286 standards do not specify any requirements in this area. In Canada, the site selection process is considered part of the nuclear licensing process. Specific requirements regarding activities to select a site are specified by the Canadian Nuclear Safety Commission.

3.4 Difference in Requirements

The Comparison Table (Section 4) provides:

(a) A description of the requirements as identified in 10CFR50 Appendix B, ASME NQA-1-1994, and the CSA N286 series of standards.

(b) An evaluation of differences between the two sets of standards, and

(c) An assessment of differences with respect to the ACR QA program and the required actions, as applicable.

Overall, both ASME NQA-1 and the CSA N286 series of standards require that quality assurance programs applicable to nuclear facilities address the same quality assurance program elements. This comparison shows there are no fundamental differences between ASME NQA-1-1994 and the CSA N286 series of standards, and that the differences are only in details with respect to implementation of the requirements. As noted in the Comparison Table, in some areas, where there are significant differences in the two sets of standards, the existing ACR QA program covers the differences adequately. There are, however, a few areas where the ACR QA program needs some minor modifications. The table below identifies areas of significant differences and the required actions to modify the ACR QA program applicable to ACR Design Certification phase. The Comparison Table (last column) provides detailed assessment on the ACR QA program for each of the NQA-1-1994 requirements.

NQA-1 Clause	Area of Significant Differences	Required Action
Clause 2 QA Program	a) Qualification of Inspection and Test Personnel and Non- destructive Examination Personnel	ACR to ensure that the organizations performing inspections and tests and non-destructive examination activities for ACR Design Certification meet the additional requirements of Supplements 2S-1 and 2S-2 of NQA1-1994. ACR to review its QA program and modify the QA Manual and/or procedures as appropriate.
	b) Qualification of lead auditors	ACR to ensure that the additional requirements on lead auditor qualification (Supplement 2S-3 of NQA1-1994) are reviewed and

NQA-1 Clause	Area of Significant Differences	Required Action
		incorporated into the audit procedure, as appropriate.
	c) Personnel Indoctrination and Training	ACR to produce and implement procedure/operating instructions to meet the requirements of personnel indoctrination and training (Supplement 2S-4 of NQA1-1994).
Clause 3 Design Control	a) Design Reviews	ACR to review the Design Review procedure and modify it as appropriate to ensure that the requirements of Clause 4.2.1 of Supplement 3S-1 are met.
	b) Qualification Tests	ACR to ensure that qualification testing demonstrates adequacy of performance under the most adverse design conditions; establishes and verifies scaling laws; and applies error analysis, where applicable, to the results of model test work, prior to use in final design work; ACR to review the qualification test specification procedure and revise it as appropriate.
Clause 7 Control of Purchased Items and Services	a) Commercial Grade Items	ACR to review its method of acceptance of commercial grade items, when it utilizes such items, and produce a procedure or operating instructions to ensure that the requirements of Clause 10 of Supplement 7S1 are followed.

The CSA N286 Series of Standard

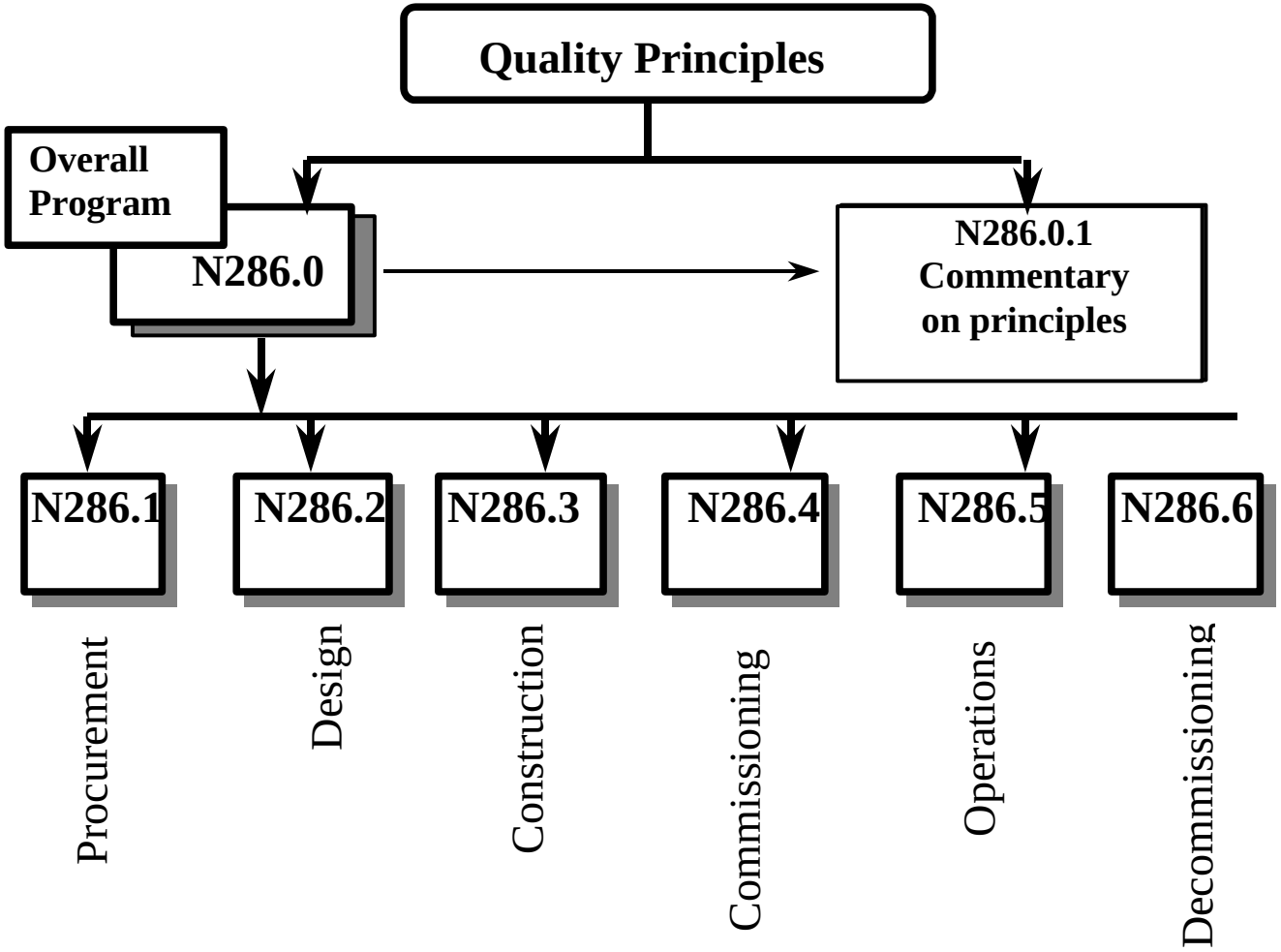

Figure 1

4. COMPARISON TABLE

Comparison of 10CFR50 Appendix B and ASME NQA-1-1994 Versus CSA N286 Series of Standards

Prepared by R. Abel (Consultant)

(Reviewed by: R. K. Ghai, AECL and T. V. Sarma, Bechtel Power Corporation)

Note: The last column of this Table (prepared by R. K. Ghai) identifies impact of significant differences, if any, on the ACR QA Program, in the following four categories:

(a) No Significant Difference; No Impact on the ACR QA Program
(b) Significant Differences; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures
(c) Significant Differences; Some Impact on the ACR QA Program; ACR QA Program to review and take appropriate action
(d) N/A (This QA element is not applicable at this time for the ACR Design Certification phase)

Comparison Table

Index

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
INTRODUCTION. Every applicant for a construction permit is required by the provisions of § 50.34 to include in its preliminary safety analysis report a description of the quality assurance program to be applied to the design, fabrication, construction, and testing of the structures, systems, and components of the facility. Every applicant for an operating license is required to include, in its final safety analysis report, information pertaining to the managerial and administrative controls to be used to assure safe operation. Nuclear power plants and fuel reprocessing plants include structures, systems, and components that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. This appendix establishes quality assurance requirements for the design, construction, and operation of those structures, systems; and components.	**I. INTRODUCTION** **1. Purpose** This Part (Part I) sets forth requirements for the establishment and execution of quality assurance programs for the siting, design, construction, operation, and decommissioning of nuclear facilities. Non-mandatory guidance is provided in the Appendices in Part III.	**N286.0-92** **1. Scope** 1.1 This Standard is addressed to the owner of a nuclear power plant, hereinafter called "the owner. 1.2 This Standard contains the requirements for the owner's overall quality assurance program for a nuclear power plant. This program encompasses all phases of a nuclear power plant life cycle, including site evaluation, design, procurement, manufacturing, construction and installation, commissioning, operation, and decommissioning. It covers the owner's activities associated with specifying, directing, and administering the work to be done during these phases, and the evaluation and integration of the activities and programs of participants. **N286.1-00** **1. Scope** 1.1 This Standard contains requirements for the quality assurance program applicable to procurement for a nuclear power plant and is the governing Standard for procurement quality assurance activities. **N286.2-00** **1. Scope** 1.1 This Standard contains requirements for the quality assurance programs applicable to the design of safety-related systems, components and structures of a nuclear power plant, as identified by the owner.	NQA-1 applies to any nuclear facility; N286.0 and its sub-tier standards apply to nuclear power plants. The N286 standards are generic enough to be applicable to any nuclear facility at the client's request.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
INTRODUCTION Cont'd. The pertinent requirements of this appendix apply to all activities affecting the safety-related functions of those structures, systems, and components; these activities include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, and modifying.	**2. Applicability** The requirements of this Part (Part I) apply to activities which could affect the quality of structures, systems, and components of nuclear facilities. Nuclear facilities include facilities for power generation, spent fuel storage, waste storage, fuel reprocessing, and plutonium processing and fuel fabrication. These activities include the following: a) the performing functions of attaining quality objectives; b) the functions of assuring that an appropriate quality assurance program is established; and c) the function of verifying that activities affecting quality have been correctly performed. Activities affecting quality include siting, designing, purchasing, fabricating, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, modifying, and decommissioning. The application of this Part (Part I), or portions thereof, shall be specified in written contracts, policies, procedures, or instructions.	**N286.0-92** **1. Scope** 1.3 This Standard applies to safety-related systems and requires the owner to specify all equipment and activities to which this Standard and the second-tier Standards shall be applied. The second-tier N286 Standards are as follows: CAN 3-N286.1, Procurement Quality Assurance for Nuclear Power Plants; CAN 3-N286.2, Design Quality Assurance for Nuclear Power Plants; CAN3-N286.3, Construction and Installation Quality Assurance for Nuclear Power Plants; CAN3-N286.4, Commissioning Quality Assurance for Nuclear Power Plants; and CAN 3-N286.5, Operations Quality Assurance for Nuclear Power Plants. Each second-tier Standard is complete in itself and is the governing Standard for that specific phase of the power plant life cycle. **N286.1-00** **1. Scope** 1.3 This Standard applies to the procurement of safety-related items and services during all constituent phases of the power plant's life, from design through decommissioning. It may be applied to other items or services at the discretion of the owner. **N286.2-00** **1. Scope** 1.3 This Standard is applicable to all aspects of design work, including conceptual studies, preliminary design, detailed design, and the production of design documentation for licensing, constructing, installing, testing, commissioning, operating, and decommissioning activities.	NQA-1 applies to any project participant who is contractually obligated to meet this standard. NQA-1 does not have the concept of "safety related system". NQA-1 applies to activities, which could affect the quality of structures, systems, and components. N286.0 is addressed to the owner who is responsible to ensure that all participants meet the requirements of this and any applicable sub-tier standards. The sub-tier standards address QA requirements for procurement, design, construction and installation, commissioning, operations, decommissioning, manufacturing. Modification is addressed in the N286 series of standards by specifying requirements to control changes. Note that CANDU reactors have on-power refuelling. This operation is considered part of the operations phase, and would be generally covered by CSA N286.5. The N286 series of standards does not address any activities associated with siting.	Siting is also not called upon in 10CFR50 App B. However, the NRC staff believe that organizations applying for Early Site Permit should include quality control elements applicable for siting in their QA program. This QA element is not applicable for the ACR Design Certification phase.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
INTRODUCTION Cont'd. As used in this appendix, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements.	**3. Responsibility** The organization invoking this Part (Part I) shall be responsible for specifying which Basic Requirements and Supplements, or portions thereof, apply, and appropriately relating them to specific items and services. The organization upon which this Part (Part I), or portions thereof, is invoked shall be responsible for complying with the specified requirements.	**N286.0-92** **1 Scope** 1.1 This Standard applies to safety-related systems and requires the owner to specify all equipment and activities to which this Standard and the second-tier Standards shall be applied. 1.3 This Standard applies to safety-related systems and requires the owner to specify all equipment and activities to which this Standard and the second-tier Standards shall be applied. (Partial text of clause) **N286.1-00** **1. Scope** 1.1 This Standard contains requirements for the quality assurance program applicable to procurement for a nuclear power plant and is the governing Standard for procurement quality assurance activities. 1.3 This Standard applies to the procurement of safety-related items and services during all constituent phases of the power plant's life, from design through decommissioning. It may be applied to other items or services at the discretion of the owner. **N286.2-00** **1. Scope** 1.1 This Standard contains the requirements for quality assurance programs applicable to the design of safety-related systems, components, and structures of a nuclear power plant, as identified by the owner. 1.3 This Standard is applicable to all aspects of design work, including conceptual studies, preliminary design, detailed design, and the production of design documentation for licensing, constructing, installing, testing, commissioning, operating, and decommissioning activities.	There appear to be no significant differences between NQA-1 and the N286 series of standards.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	4. Terms and Definitions This clause provides definitions for 46 terms used in the standard.	**N286.0-92** **2. Definitions** This clause provides definitions for 20 terms. The sub-tier N286 standards also have sets of definitions related to the applicable life cycle phase.	NQA-1 includes a number of definitions of commonly understood terms, such as "Design, Final", "Guideline", "Rework", "Service". The N286 standards rely on the dictionary definitions of such terms.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
I. ORGANIZATION The applicant[1] shall be responsible for the establishment and execution of the quality assurance program. The authority and duties of persons and organizations performing activities affecting the safety-related functions of structures, systems, and, components shall be clearly established and delineated in writing. These activities include both the performing functions of attaining quality objectives and the quality assurance functions. The quality assurance functions are those of (a) assuring that an appropriate quality assurance program is established and effectively executed and (b) verifying, such as by checking, auditing, and inspection, that activities affecting the safety-related functions have been correctly performed. The persons and organizations performing quality assurance functions shall have sufficient authority and organizational freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. Such persons and organizations performing quality assurance functions shall 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.	**BASIC REQUIREMENT 1: ORGANIZATION** The organizational structure, functional responsibilities, levels of authority, and lines of communication for activities affecting quality shall be documented. Persons or organizations responsible for assuring that an appropriate quality assurance program has been established and verifying that activities affecting quality have been correctly performed shall 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. Such persons or organizations shall have direct access to responsible management at a level where appropriate action can be effected. Such persons or organizations shall report to a management level such that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations.	**N286.0-92** **5. Organization and Responsibilities** 5.1 The owner shall ensure that overall and second-tier measures are established to a) define and document the organizational structure, functional responsibilities, and levels of authority within organizational units; b) ensure that responsibilities of organizational units and assignments to individuals are effectively communicated; c) identify the participants required to meet the CSA N286 Standards, and shall clearly establish and document their responsibilities; d) identify the person(s) responsible for the implementation and effectiveness of the overall quality assurance program; e) ensure that the person(s) responsible for monitoring and assessing the effectiveness of the overall quality assurance program report to a management level such that the required authority and organizational freedom are provided. Such person(s) shall be independent of cost and schedule considerations; and f) ensure that the organizational structure and assignment of responsibility shall be such that persons performing, verifying, and auditing work are appropriately independent. **13. Nonconformance** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

[1] While the term “applicant” is used in these criteria, the requirements are, of course, applicable after such a person has received a licence to construct and operate a nuclear power plant or a fuel reprocessing plant. These criteria will also be used for guidance in evaluating the adequacy of construction permits and operating licenses.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	SUPPLEMENT 1S-1 ***Supplementary Requirements for Organization*** ***1. General*** *This Supplement provides amplified requirements for organization. It supplements the requirements of Basic Requirement 1 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
I. ORGANIZATION Cont'd Because of the many variables involved, such as the number of personnel, the type of activity being performed, and the location or locations where activities are performed, the organizational structure for executing the quality assurance program may take various forms provided that the persons and organizations assigned the quality assurance functions have this required authority and organizational freedom.	***2. RESPONSIBILITY*** ***2.1 Purpose*** *The organizational structure and the responsibility assignments shall be such that:* a) *quality is achieved and maintained by those who have been assigned responsibility for performing work; and* b) *quality achievement is verified by persons or organizations not directly responsible for performing the work.*	**N286.0-92** **3. Program Definition** 3.4 The overall program shall be approved by the owner's senior management. 5. Organization and Responsibilities 5.1 The owner shall ensure that overall and second-tier measures are established to a) define and document the organizational structure, functional responsibilities, and levels of authority within organizational units; b) ensure that responsibilities of organizational units and assignments to individuals are effectively communicated; c) identify the participants required to meet the CSA N286 Standards, and shall clearly establish and document their responsibilities; d) identify the person(s) responsible for the implementation and effectiveness of the overall quality assurance program; e) ensure that the person(s) responsible for monitoring and assessing the effectiveness of the overall quality assurance program report to a management level such that the required authority and organizational freedom are provided. Such person(s) shall be independent of cost and schedule considerations; and f) ensure that the organizational structure and assignment of responsibility shall be such that persons performing, verifying, and auditing work are appropriately independent.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
I. ORGANIZATION Cont'd. The applicant may delegate to others, such as contractors, agents, or consultants, the work of establishing and executing the quality assurance program, or any part thereof, but shall retain responsibility therefor.	***2.2 Delegation of Work*** *The individual(s) or organization(s) responsible for establishing and executing a quality assurance program under this Standard may delegate any or all of the work to others but shall retain responsibility therefor.*	**N286.0-92** **1. Scope** 1.2 This Standard contains the requirements for the owner's overall quality assurance program for a nuclear power plant. This program encompasses all phases of a nuclear power plant life cycle, including site evaluation, design, procurement, manufacturing, construction and installation, commissioning, operation, and decommissioning. It covers the owner's activities associated with specifying, directing, and administering the work to be done during these phases, and the evaluation and integration of the activities and programs of participants. **3. Program Definition** 3.5 The quality assurance programs of participants shall be reviewed and approved by the owner. **N286.1-00** **1. Scope** 1.2 This Standard is addressed to the owner and is applicable to procurement activities carried out by both the owner and participants designated by the owner. 3.1 Program Definition 3.1.1 The owners and participants shall establish, implement, and maintain a procurement quality assurance program that is in accordance with this Standard. **N286.2-00** **3.1 Program Definition** 3.1.1 The owner shall identify the design organizations that shall meet this Standard.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2.3 Nonconforming Items *Responsibility for the control of further processing, delivery, installation, or operation of nonconforming items shall be designated in writing.*	**N286.0-92** **13. Nonconformances** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.1-00** **3.11 Nonconformance** Non-conforming processes, practices, and documents shall be a) identified, documented, and reported; b) reviewed, resolved, verified, and the results documented; and c) controlled to prevent unauthorized use or implementation. **N286.2-00** **3.11 Nonconformance** 3.11.1 Non-conformance found during the design process shall be identified, documented, reported, and reviewed for disposition. 3.11.2 The responsibilities for the disposition of non-conformances shall be identified.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
I. ORGANIZATION Cont'd. Irrespective of the organizational structure, the individual(s) assigned the responsibility for assuring effective execution of any portion of the quality assurance 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.	***3. MULTIPLE ORGANIZATIONS*** ***3.1 Responsibility*** *Where more than one organization is involved in the execution of activities covered by this Part (Part I), the responsibility and authority of each organization shall be clearly established and documented.*	**N286.0-92** **5. Organization and Responsibilities** 5.1 The owner shall ensure that overall and second-tier measures are established to a) define and document the organizational structure, functional responsibilities, and levels of authority within organizational units; b) ensure that responsibilities of organizational units and assignments to individuals are effectively communicated; c) identify the participants required to meet the CSA N286 Standards, and shall clearly establish and document their responsibilities; **N286.1-00** **3. 3 Organization and Responsibilities** 3.3.1 The owners and participants shall define and document the a) organizational structure; b) functional responsibilities; c) levels of authority; and d) internal and external interfaces. **N286.2-00** **3.3 Organization and Responsibilities** 3.3.1 An organizational plan shall be documented, showing: a) organizational structure; b) functional responsibilities; c) levels and type of authority, associated responsibilities; and d) internal and external interfaces. When multiple organizational arrangements exist, the responsibility and the relationship between each organization shall be established and documented.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	3.2 Interface Control *3.2.1 The external interfaces between organizations and the internal interfaces between organizational units, and changes thereto, shall be documented.* *3.2.2 Interface responsibilities shall be defined and documented.*	**N286.0-92** **5. Organization and Responsibilities** 5.1 The owner shall ensure that overall and second-tier measures are established to a) define and document the organizational structure, functional responsibilities, and levels of authority within organizational units; b) ensure that responsibilities of organizational units and assignments to individuals are effectively communicated; c) identify the participants required to meet the CSA N286 Standards, and shall clearly establish and document their responsibilities; **8. Communication** 8.1 The owner shall establish requirements to ensure effective communication and work integration among organizational units including participants. **N286.1-00** **3. 3 Organization and Responsibilities** 3.3.1 The owners and participants shall define and document the a) organizational structure; b) functional responsibilities; c) levels of authority; and d) internal and external interfaces. **N286.2-00** **3.3 Organization and Responsibilities** 3.3.1 An organizational plan shall be documented, showing: a) organizational structure; b) functional responsibilities; c) levels and type of authority, associated responsibilities; and d) internal and external interfaces. When multiple organizational arrangements exist, the responsibility and the relationship between each organization shall be established and documented**.**	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
II. QUALITY ASSURANCE PROGRAM The applicant shall establish at the earliest practicable time, consistent with the schedule for accomplishing the activities, a quality assurance program which complies with the requirements of this appendix. This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures or instructions. The applicant shall identify the structures, systems, and components to be covered by the quality assurance program and the major organizations participating in the program, together with the designated functions of these organizations. The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety. Activities affecting quality shall be accomplished under suitably controlled conditions. Controlled conditions include the use of appropriate equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanness; and assurance that all prerequisites for the given activity have been satisfied. The program shall take into account the need 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 shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. The applicant shall regularly review the status and adequacy of the quality assurance program. Management of other organizations participating in the quality assurance program shall regularly review the status and adequacy of that part of the quality assurance program which they are executing.	**BASIC REQUIREMENT 2: QUALITY ASSURANCE PROGRAM** A documented quality assurance program shall be planned, implemented, and maintained in accordance with this Part (Part I), or portions thereof. The program shall identify the activities and items to which it applies. The establishment of the program shall include consideration of the technical aspects of the activities affecting quality. The program shall provide control over activities affecting quality to an extent consistent with their importance. The program shall be established at the earliest time consistent with the schedule for accomplishing the activities. The program shall provide for the planning and accomplishment of activities affecting quality under suitably controlled conditions. Controlled conditions include the use of appropriate equipment, suitable environmental conditions for accomplishing the activity, and assurance that prerequisites for the given activity have been satisfied. The program shall provide for any special controls, processes, test equipment, tools, and skills to attain the required quality and for verification of quality. The program shall provide for indoctrination and training, as necessary, of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained. Management of those organizations implementing the quality assurance program, or portions thereof, shall regularly assess the adequacy of that part of the program for which they are responsible and shall assure its effective implementation.	**N286.0-92** **3. Program Definition** 3.1 The owner shall establish, implement, and maintain an overall quality assurance program. 3.2 The owner shall describe the overall quality assurance program in a quality assurance manual in sufficient detail to demonstrate that the requirements of this Standard are met. 3.6 The owner shall ensure that before work is performed, the applicable portion of the quality assurance program is documented and approved. **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **18. Program Assessment** **18.3 Program Review** Formal reviews of the effectiveness of the overall program, including the second-tier measures established to meet this Standard, shall be conducted by or on behalf of the owner, at least annually. **N286.1-00** **3.1 Program Definition** 3.1.1 The owners and participants shall establish, implement, and maintain a procurement quality assurance program that is in accordance with this Standard.	NQA-1 Basic Requirement 2 is essentially a summary of the main elements of an effective QA program. It identifies high level requirements for verification, program assessment, training and qualification, the control of items processes and practices, etc. The N286 series of standards does not have such a summary statement. However, requirements similar to those alluded to in NQA-1, Basic Requirement 2, are addressed in the body of the N286 series of standards.	No Significant Difference; No Impact on the ACR QA Program.

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See above.	See above.	**N286.1-00** **3.1 Program Definition Cont'd** 3.1.2 The owners and participants shall describe the procurement quality assurance program in sufficient detail to demonstrate that the requirements of this Standard have been met. This shall include a) a procurement quality assurance policy statement; b) a statement of quality assurance program applicability; c) an organizational structure; d) procedures, directly or by reference, that detail the quality assurance program; and e) the identification of the relationship and hierarchy of documents used in the program. 3.1.3 Before procurement of safety-related items or services is performed, the applicable portion of the participant's or owner's quality assurance program(s) shall be documented, approved by the owner, and implemented. Procurement activities affecting quality shall be planned and documented in such a way as to meet the objectives of the procurement quality assurance program. **3.4 Personnel Capability** 3.4.1 Personnel who are responsible for procurement activities shall be competent to perform their assigned tasks. **N286.2-00** **3.1 Program Definition** 3.1.3 Each design organization shall establish, implement, and maintain a design quality assurance program that is effective and in accordance with this Standard.	See above.	See above.

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See above.	See above.	**N286.2-00** **3.1 Program Definition Cont'd** 3.1.6 Each design organization shall describe the design quality assurance program in sufficient detail to demonstrate that the requirements of this Standard have been met. This shall include: a) a design quality assurance policy statement; b) a statement of quality assurance program applicability; c) an organizational structure; d) procedures directly, or by reference, that detail the quality assurance program; and e) the identification of the relationship and hierarchy of documents used in the program. 3.1.7 The design organization shall have the applicable portions of its design quality assurance program in place before undertaking any design activities covered by this Standard. Design activities affecting quality shall be planned and documented in such a way as to meet the objectives of the design quality assurance program. **3.4 Personnel Capability** 3.4.1 Personnel qualification criteria shall be established. These criteria shall include a definition of the minimum education, experience, initial training, and continuing training requirements. Records of the qualifications of personnel participating in the design activities shall be maintained. **3.16.4 Program Review** 3.16.4.1 In addition to these ongoing self-assessments, the manager with corporate responsibility for design shall conduct and document a review, at least annually, of the effectiveness of the design quality assurance program.	See above.	See above.

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	SUPPLEMENT 2S-1 ***Supplementary Requirements for the Qualification of Inspection and Test Personnel*** ***1. GENERAL*** *This Supplement provides amplified requirements for the qualification of personnel who perform inspection and testing to verify conformance to specified requirements for the purpose of acceptability. It supplements the requirements of Basic Requirement 2 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I). The requirements of this Supplement do not apply to the qualification of personnel for performance of nondestructive examination.*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994. It excludes NDE personnel from the requirements of this Supplement.	

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	2. CERTIFICATION ***2.1 Qualification Requirements*** *The responsible organization shall designate those activities that require qualified inspection and test personnel and the minimum requirements for such personnel. Further, the responsible organization shall establish written procedures for the qualification of inspection and test personnel, and for the assurance that only those personnel who meet the requirements of this Supplement are permitted to perform inspection and test activities.* *When a single inspection or test requires implementation by a team or a group, personnel not meeting the requirements of this Part (Part I) may be used in data-taking assignments or in plant or equipment operation, provided they are supervised or overseen by a qualified individual.*	**N286.3-99** **3.4 Personnel Capability** 3.4.3 Training programs shall be established as necessary to ensure that the required proficiency of personnel is achieved and maintained. 3.4.4 Records of qualifications shall be maintained throughout the construction phase for personnel who perform inspection, examination, testing, or audit activities.	The N286 series of standards does not specify to the same level of detail the training and qualification requirements for those performing inspections and tests, as does NQA-1. CSA N286.3-99 specifies the high level requirement that those performing inspections, examinations, testing, or auditing have to be appropriately qualified. Unique NQA-1 requirements are: - Designate those activities that require qualified inspection and test personnel and the minimum requirements for such personnel. - Establish written procedures for: • The qualification of inspection and test personnel; • The assurance that only those personnel who meet the requirements of this Supplement are permitted to perform inspection and test activities. - Use personnel not meeting the qualification requirements of ASME NQA-1-1994 only in data-taking assignments or in plant or equipment operation, provided they are supervised or overseen by a qualified individual.	Significant Differences; Some Impact on the ACR QA Program; ACR Program to ensure that the organizations performing inspections and tests are qualified and meet the requirements of Supplement 2S-1 of NQA1-1994.

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	2.2 Personnel Selection *Personnel selected for performing inspection and test activities shall have the experience or training commensurate with the scope, complexity, or special nature of the activities.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them.	The N286 series of standards does not have a specific requirement that personnel performing inspections and tests have the necessary experience or training commensurate with the scope, complexity, or special nature of the activities.	See above
	2.3 Indoctrination *Provisions shall be made for the indoctrination of personnel as to the technical objectives and requirements of the applicable codes and standards, and the quality assurance program elements that are to be employed.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them.	The N286 series of standards does not have a specific requirement for the indoctrination of personnel performing inspections and tests.	See above
	2.4 Training *The need for a formal training program shall be determined, and such training activities shall be conducted as required to qualify personnel who perform inspections and tests. On-the-job training shall also be included in the program, with emphasis on firsthand experience gained through actual performance of inspections and tests.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them.	The N286 series of standards does not have a specific requirement for the training of personnel performing inspections and tests. Unique NQA-1 requirements are: • Determine the need for a formal training program; • Conduct such training activities as required to qualify personnel who perform inspections and tests, including on-the-job training, with emphasis on firsthand experience gained through actual performance of inspections and tests.	See above
	2.5 Determination of Initial Capability *The capabilities of a candidate for certification shall be initially determined by a suitable evaluation of the candidate's education, experience, training, and either test results or capability demonstration.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them.	The N286 series of standards does not have a specific requirement for the initial evaluation of candidates' qualifications to perform inspections and tests.	See above

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	2.6 Evaluation of Performance *The job performance of inspection and test personnel shall be reevaluated at periodic intervals not to exceed 3 years. Reevaluation shall be by evidence of continued satisfactory performance or re-determination of capability in accordance with the requirements of para. 2.5 above. If during this evaluation or at any other time, it is determined by the responsible organization that the capabilities of an individual are not in accordance with the qualification requirements specified for the job, that person shall be removed from that activity until such time as the required capability has been demonstrated. Any person who has not performed inspection or testing activities in his qualified area for a period of 1 year shall be re-evaluated by a re-determination of required capability in accordance with the requirements of para. 2.5 above.*		The N286 series of standards does not have a specific requirement for the periodic reassessment of the qualifications of inspection and test personnel. Unique NQA-1 requirements are: • Re-evaluate the job performance of inspection and test personnel periodically, but at least every 3 years; • Re-evaluate on the basis of continued satisfactory performance or re-determination of capability based on the requirements of initial certification (par. 2.5); • To remove anyone from an activity who is found lacking in the required qualifications either during such a re-evaluation or at any other time, until such time as the required capability has been demonstrated; • To re-evaluate by a re-determination of required capability in accordance with the requirements of par. 2.5 above any person who has not performed inspection or testing activities in his qualified area for a period of 1 year.	See above

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	2.7 Certificate of Qualification *The qualification of personnel shall be certified in writing in an appropriate form, including the following information:* *a) employer's name;* *b) identification of person being certified;* *c) activities certified to perform;* *d) basis used for certification, which includes such factors as:* *1) education, experience, indoctrination, and training* *2) test results, where applicable* *3) results of capability demonstration* *e) results of periodic evaluation;* *f) results of physical examinations, when required;* *g) signature of employer's designated representative who is responsible for such certification;* *h) date of certification and date of certification expiration.*		The N286 series of standards does not have a specific requirement for certificates of qualifications of inspection and tests personnel.	See above
	2.8 Physical *The responsible organization shall identify any special physical characteristics needed in the performance of each activity, including the need for initial and subsequent physical examination.*		The N286 series of standards does not have a specific requirement for identifying any special physical characteristics of inspection and tests personnel.	See above

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	3. RECORDS ***3.1 Record Files*** *Records of personnel qualification shall be established and maintained by the employer. These records shall include the information required by para. 2.7 above.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.2 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered.	The N286 series of standards does not have a specific requirement for establishing and maintaining records of personnel qualifications of inspection and tests personnel, including in these records the information required for certificates of qualification, par. 2.7.	See above
	SUPPLEMENT 2S-2 ***Supplementary Requirements for the Qualification of Non-destructive Examination Personnel*** ***1. GENERAL*** *This Supplement provides amplified requirements for the qualification of personnel who perform radiographic (RT), magnetic particle (MI), ultrasonic (UT), liquid penetrant (PT), electromagnetic (ET), neutron radiographic (NRT), leak testing (LT), acoustic emission (AE), and visual testing (VT) [hereinafter referred to as nondestructive examination (NDE)] to verify conformance to specified requirements. It supplements the requirements of Basic Requirement 2 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2. CERTIFICATION ***2.1 Applicable Documents*** *The American Society of Nondestructive Testing Recommended Practice No. SNT-TC-1A, June 1980 Edition, and its applicable supplements shall apply as requirements to NDE personnel covered by this Supplement.*		The N286 series of standards does not specify to the same level of detail the training and qualification requirements for those performing non-destructive testing, as does NQA-1. Unique NQA-1 requirements are: The recommendations in **American Society of Non-destructive Testing Recommended Practice No. SNT-TC-1A**, June 1980 Edition, and its applicable supplements apply as requirements to NDE personnel.	Significant Differences; Some Impact on the ACR QA Program; ACR Program to ensure that the organizations performing non-destructive testing are qualified and meet the requirements of Supplement 2S-2 of NQA1-1994.
	2.2 Program *The responsible organization shall establish written procedures for the control and administration of NDE personnel training, examination, and certification.*		The N286 series of standards does not specify to the same level of detail the training and qualification requirements for those performing non-destructive testing, as does NQA-1. Unique NQA-1 requirements are: Establish written procedures for the control and administration of NDE personnel training, examination, and certification.	See above

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	2.3 Records *Records of personnel qualification shall be established and maintained by the employer.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.2 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered.	The N286 series of standards does not have a specific requirement for establishing and maintaining records of personnel qualifications of NDE personnel.	See above
	SUPPLEMENT 2S-3 ***Supplementary Requirements for the Qualification of Quality Assurance Program Audit Personnel*** ***1. GENERAL*** *This Supplement provides amplified requirements for the qualification of an audit team leader, henceforth identified as a Lead Auditor, who organizes and directs audits, reports audit findings, and evaluates corrective action. This Supplement also provides amplified requirements for the qualifications of individuals, henceforth referred to as Auditors, who participate in an audit, such as technical specialists, management representatives, and auditors-in-training. It supplements the requirements of Basic Requirement 2 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2. QUALIFICATION OF AUDITORS ***2.1 Responsibility of Auditing Organization*** *The responsible auditing organization shall establish the audit personnel qualifications and the requirements for the use of technical specialists to accomplish the auditing of quality assurance programs. Personnel selected for quality assurance auditing assignments shall have experience or training commensurate with the scope, complexity, or special nature of the activities to be audited. Auditors shall have, or be given, appropriate training or orientation to develop their competence for performing required audits. Competence of personnel for performance of the various auditing functions shall be developed by one or more of the methods given in (a) through (c) below:* a) *orientation to provide a working knowledge and understanding of this Part (Part I) and the auditing organization's procedures for implementing audits and reporting results;* b) *training programs to provide general and specialized training in audit performance. General training shall include fundamentals, objectives, characteristics, organization, performance, and results of quality auditing. Specialized training shall include methods of examining, questioning, evaluating, and documenting specific audit items and methods of closing out audit findings.* c) *on-the-job training, guidance, and counselling under the direct supervision of a Lead Auditor. Such training shall include planning, performing, reporting, and follow-up action involved in conducting audits.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.2 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered.	The N286 series of standards does not have a specific requirement for establishing and maintaining records of personnel qualifications of audit personnel, including all the detailed requirements in NQA-1, Basic Requirement 2, Supplement 2S-3 – clause 2.1.	Significant Differences; Some Impact on the ACR QA Program. ACR QA Program to ensure that the additional requirements on lead auditor qualification are reviewed and incorporated into the audit procedure, as appropriate.

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	3. QUALIFICATION OF LEAD AUDITORS *An individual shall meet the requirements of paras. 3.1 through 3.4 below prior to being designated a Lead Auditor.*		This NQA-1-1994 clause is a paragraph introducing the additional requirements on lead auditor qualification requirements specified in the named sub-clauses.	See above
	3.1 Communication Skills *The prospective Lead Auditor shall have the capability to communicate effectively, both in writing and orally. These skills shall be attested to in writing by the Lead Auditor's employer.*		The N286 series of standards does not specify any detailed requirements for the training and qualification of auditors and lead auditors. Unique NQA-1 requirements are: Attest to the prospective lead auditor's capability to communicate effectively, both in writing and orally.	See above

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	3.2 Training *Prospective Lead Auditors shall have training to the extent necessary to assure their competence in auditing skills. Training in the following areas shall be given based upon management evaluation of the particular needs of each prospective Lead Auditor.* *3.2.1 Knowledge and understanding of this Part (Part I) and other nuclear-related codes, standards, regulations, and regulatory guides, as applicable.* *3.2.2 General structure of quality assurance programs as a whole and applicable elements as defined in this Part (Part I).* *3.2.3 Auditing techniques of examining, questioning, evaluating, and reporting; methods of identifying and following up on corrective action items; and closing out audit findings.* *3.2.4 Audit planning in the quality-related functions for the following activities: siting, designing, purchasing, fabricating, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, modifying, and decommissioning of nuclear facilities or associated components, and safety aspects of the nuclear facility.* *3.2.5 On-the-job training to include applicable elements of the audit program.*		The N286 series of standards does not specify any detailed requirements for the training and qualification of auditors and lead auditors.	See above
	3.3 Audit Participation *The prospective Lead Auditor shall have participated in a minimum of five (5) quality assurance audits within a period of time not to exceed 3 years prior to the date of qualification, one audit of which shall be a nuclear quality assurance audit within the year prior to his qualification.*		The N286 series of standards does not specify any detailed requirements for the training and qualification of auditors and lead auditors.	See above

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	3.4 Examination *The prospective Lead Auditor shall pass an examination which shall evaluate his comprehension of and ability to apply the body of knowledge identified in para. 3.2 above. The examination may be oral, written, practical, or any combination of the three types. The development and administration of the examination shall be in accordance with Section 5 of this Supplement.*		The N286 series of standards does not specify any detailed requirements for the examination of lead auditors.	See above
	4. MAINTENANCE OF QUALIFICATION ***4.1 Maintenance of Proficiency*** *Lead Auditors shall maintain their proficiency through one or more of the following: regular and active participation in the audit process; review and study of codes, standards, procedures, instructions, and other documents related to quality assurance program and program auditing; or participation in training program(s). Based on annual assessment, management may extend the qualification, require retraining, or require re-qualification. These evaluations shall be documented.*		The N286 series of standards does not specify any detailed requirements for the training and qualification of auditors and lead auditors.	See above
	4.2 Re-qualification *Lead Auditors who fail to maintain their proficiency for a period of 2 years or more shall require re-qualification. Re-qualification shall include retraining in accordance with the requirements of para. 3.2 above, re-examination in accordance with para. 3.4 above, and participation as an Auditor in at least one nuclear quality assurance audit.*		The N286 series of standards does not specify any detailed requirements for the training and qualification of auditors and lead auditors.	See above

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	5. ADMINISTRATION ***5.1 Organizational Responsibility*** *Training of auditors shall be the responsibility of the employer. The responsible auditing organization shall select and assign personnel who are independent of any direct responsibility for performance of the activities which they will audit. The Lead Auditor shall, prior to commencing the audit, concur that assigned personnel collectively have experience or training commensurate with the scope, complexity, or special nature of the activities to be audited.*	**N286.0-92** **18.2 Audit** The owner shall ensure that audit programs meet the following requirements: a) Audits shall be conducted in accordance with approved procedures to confirm that the quality assurance program has been established and implemented effectively. b) Audits shall be carried out at a frequency sufficient to confirm continuing conformance with requirements. c) Audit scope and timing shall be appropriate to the status and duration of the phase being audited. d) Audits shall include • the overall program; • second-tier programs including participants' programs; and • interfaces between programs. e) Audits shall be carried out by personnel who neither performed nor verified activities being audited. f) Audit results shall be documented, and then reported to and assessed by a level of management having sufficient breadth of responsibility to ensure that action is taken to address audit findings. **N286.1-00** **3.16 Program Assessment** 3.16.4 Individuals responsible for assessing the procurement quality assurance program shall have neither performed nor verified the activity being assessed.	The N286 series of standards does not specify any detailed requirements for the selection of auditors and lead auditors. The N286 series does not require a formal concurrence from the lead auditor that audit team members are appropriately qualified. Both standards have similar requirements regarding the independence of auditors from having performed the work being audited.	See above

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See above.	See above.	**N286.2-00** **3.6.2 Independent Assessment** 3.16.2.4 The person(s) responsible for independently assessing the design quality assurance program shall a) have access to personnel, work activities, documents, and records as necessary to assess the program; b) be independent of cost and schedule considerations; and c) have neither performed nor verified the activities being assessed.	See above.	See above
	5.2 Qualification Examination *The development and administration of the examination for a Lead Auditor required by para. 3.4 above is the responsibility of the employer. The employer may delegate this activity to an independent certifying agency, but shall retain responsibility for conformance of the examination and its administration to this Part (Part I). Integrity of the examination shall be maintained by the employer or certifying agency through appropriate confidentiality of files and, where applicable, proctoring of examinations. Copies of the objective evidence regarding the type(s) and content of the examination(s) shall be retained by the employer in accordance with the requirements of Section 6 below.*		The N286 series of standards does not specify any detailed requirements for the examination of lead auditors.	See above
	6. RECORDS ***6.1 General*** *Records of personnel qualifications for Auditors and Lead Auditors performing audits shall be established and maintained by the employer.*		The N286 series of standards does not specify any detailed requirements for establishing and maintaining qualification records of auditors and of lead auditors.	See above

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	6.2 Certification of Qualification *Each Lead Auditor shall be certified by his employer as being qualified to lead audits. This certification shall, as a minimum, document the following:* a) *employer's name;* b) *Lead Auditor's name;* c) *date of certification or recertification;* d) *basis of qualification (i.e., education, experience, communication skills, training, examination, etc.);* e) *signature of employer's designated representative who is responsible for such certification.*		The N286 series of standards does not specify any detailed requirements for lead auditor certification.	See above
	6.3 Updating of Lead Auditors' Records *Records for each Lead Auditor shall be maintained and updated annually.*		The N286 series of standards does not specify any detailed requirements for maintaining and updating lead auditor records.	See above
	SUPPLEMENT 2S-4 ***Supplementary Requirements for Personnel Indoctrination and Training*** ***1. GENERAL*** *This Supplement provides amplified requirements for the indoctrination and training of personnel performing or managing activities affecting quality. It supplements the requirements of Basic Requirement 2 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	Significant Difference; Some Impact on the ACR QA Program; ACR QA Program to produce and implement a procedure/ operating instructions to meet the requirements for personnel indoctrination and training.

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	2. APPLICABILITY *This Supplement applies to personnel performing or managing activities affecting quality. Personnel to be indoctrinated or trained shall be identified. The extent of indoctrination and training shall be commensurate with the following:* *a) the scope, complexity, and nature of the activity; and* *b) the education, experience, and proficiency of the person.* *Activities affecting quality include siting, designing, purchasing, fabricating, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refuelling, modifying, and decommissioning.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.3 Programs shall be systematically developed and established to ensure that the required competency of personnel is achieved and maintained. Programs shall be reviewed for effectiveness and kept up-to-date to reflect changes to the plant, procedures, regulations, and operating experience. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Personnel qualification criteria shall be established. These criteria shall include a definition of the minimum education, experience, initial training, and continuing training requirements. Records of the qualifications of personnel participating in the design activities shall be maintained. 3.4.2 Training programs shall be implemented to achieve and maintain the required competency of personnel. Training programs shall be reviewed for effectiveness and updated to reflect experience and changes to any applicable codes, standards, procedures, regulations, and design practices.	The N286 series of standards does not address any activities associated with siting. Unique NQA-1 requirements are: The requirements of NQA-1, Basic Requirement 4, Supplement 2S-4 apply to both those performing and managing activities affecting quality.	See above

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	3. INDOCTRINATION *Personnel shall be indoctrinated in the following subjects as they relate to a particular function:* *a) general criteria, including applicable codes, standards, and company procedures;* *b) applicable quality assurance program elements; and* *c) job responsibilities and authority.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.3 Programs shall be systematically developed and established to ensure that the required competency of personnel is achieved and maintained. Programs shall be reviewed for effectiveness and kept up-to-date to reflect changes to the plant, procedures, regulations, and operating experience. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Personnel qualification criteria shall be established. These criteria shall include a definition of the minimum education, experience, initial training, and continuing training requirements. Records of the qualifications of personnel participating in the design activities shall be maintained. 3.4.2 Training programs shall be implemented to achieve and maintain the required competency of personnel. Training programs shall be reviewed for effectiveness and updated to reflect experience and changes to any applicable codes, standards, procedures, regulations, and design practices.	Both standards have similar requirements. However, NQA-1 lists specifically applicable codes, standards, and company procedures, applicable quality assurance program elements, job responsibilities and authority as forming part of the indoctrination curriculum.	See above

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	4. TRAINING *Training shall be provided, if needed, to:* *a) achieve initial proficiency;* *b) maintain proficiency; and* *c) adapt to changes in technology, methods, or job responsibilities.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.4 Personnel Capability** 3.4.3 Programs shall be systematically developed and established to ensure that the required competency of personnel is achieved and maintained. Programs shall be reviewed for effectiveness and kept up-to-date to reflect changes to the plant, procedures, regulations, and operating experience. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Personnel qualification criteria shall be established. These criteria shall include a definition of the minimum education, experience, initial training, and continuing training requirements. Records of the qualifications of personnel participating in the design activities shall be maintained. 3.4.2 Training programs shall be implemented to achieve and maintain the required competency of personnel. Training programs shall be reviewed for effectiveness and updated to reflect experience and changes to any applicable codes, standards, procedures, regulations, and design practices.	Both standards have similar requirements. However, NQA-1 lists specifically achieving initial proficiency, maintaining proficiency; and adapting to changes in technology, methods, or job responsibilities as forming part of the training curriculum.	See above

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	5. RECORDS *Records of the implementation of indoctrination and training may take the form of:* *a) attendance sheets;* *b) training logs; or* *c) personnel training records.*	**N286.1-00** **3.4 Personnel Capability** 3.4.2 Required qualifications shall be defined and documented. Education, experience, initial training, and continuing training shall be considered. **N286.2-00** **3.4 Personnel Capability** 3.4.1 Personnel qualification criteria shall be established. These criteria shall include a definition of the minimum education, experience, initial training, and continuing training requirements. Records of the qualifications of personnel participating in the design activities shall be maintained.	Both standards have similar requirements. However, NQA-1 lists specific examples of acceptable training records.	See above

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III. DESIGN CONTROL Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions	**BASIC REQUIREMENT 3: DESIGN CONTROL** The design shall be defined, controlled, and verified. Applicable design inputs shall be appropriately specified on a timely basis and correctly translated into design documents. Design interfaces shall be identified and controlled. Design adequacy shall be verified by persons other than those who designed the item. Design changes, including field changes, shall be governed by control measures commensurate with those applied to the original design.	**N286.2-00** **1. Scope** 1.1 This Standard contains the requirements for quality assurance programs applicable to the design of safety-related systems, components, and structures of a nuclear power plant, as identified by the owner. 1.3 This Standard is applicable to all aspects of design work, including conceptual studies, preliminary design, detailed design, and the production of design documentation for licensing, constructing, installing, testing, commissioning, operating, and decommissioning activities.	NQA-1, Requirement 3, is essentially a summary of the main elements of an effective design QA program. It identifies high level requirements for verification, verifiers' independence, and design change control. N286.2-00 does not have such a summary statement. However, requirements similar to those alluded to in NQA-1 are addressed in the body of N286.2-00.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 3S-1 ***Supplementary Requirements for Design Control*** ***1. GENERAL*** *This Supplement provides amplified requirements for design control. It supplements the requirements of Basic Requirement 3 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. DESIGN INPUT *Applicable design inputs, such as design bases, performance requirements, regulatory requirements, codes, and standards, shall be identified and documented, and their selection reviewed and approved by the responsible design organization. The design input shall be specified and approved on a timely basis and to the level of detail necessary to permit the design activity to be carried out in a correct manner and to provide a consistent basis for making design decisions, accomplishing design verification measures, and evaluating design changes. Changes from approved design inputs, including the reason for the changes, shall be identified, approved, documented, and controlled.*	**N286.2-00** **5.2 Design Input** 5.2.1 Design inputs, such as functional requirements, results of previous experience, conceptual studies, environmental conditions, regulatory requirements, and applicable codes and standards, shall be considered in defining design requirements. 5.2.2 The selection of design inputs and revisions to them shall be subject to review and approval. Revisions to design requirements, including the reason for the changes, shall be identified, controlled, and documented. 5.2.3 Design requirements shall be in sufficient detail to provide a reference base for making decisions, performing design verification, and evaluating design changes.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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III. DESIGN CONTROL Cont'd These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Measures shall also be established 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 structures, systems and components.	***3. DESIGN PROCESS*** *The responsible design organization shall prescribe and document 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 shall be adequate to support facility design, construction, and operation. Appropriate quality standards shall be identified and documented, and their selection reviewed and approved.* *Changes from specified quality standards, including the reasons for the changes, shall be identified, approved, documented, and controlled.*	**N286.2-00** **4. Work Control** **4.2 Work Activities** Design activities shall be identified and controlled. These activities include a) definition of design requirements; b) review of the work assignment; c) development of the design; d) documenting of the design; e) proving the adequacy of the design; f) verifying that the design meets the requirements; g) issuing design information; and h) compiling and keeping the records. **4.3 Work Planning** Design activities shall be planned so as to define a systematic progression of activities and work practices. Work plans shall be produced. **5.9 Design Changes** 5.9.1 Procedures shall be established to identify and control changes to designs and associated documents after they have been approved. 5.9.2 Changes shall be subject to a process of review and approval similar to that applied to the original design. 5.9.3 A change and the reason(s) for it shall be documented. When a significant change is required because the design is incorrect, the design and verification activities shall be reviewed and modified as necessary.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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See above.	***3. DESIGN PROCESS Cont'd*** *Design methods, materials, parts, equipment, and processes that are essential to the function of the structure, system, or component shall be selected and reviewed for suitability of application. Applicable information derived from experience, as set forth in reports or other documentation, shall be made available to cognizant design personnel.*	**N286.2-00** **4.2 Work Activities** Design activities shall be identified and controlled. These activities include a) definition of design requirements; b) review of the work assignment; c) development of the design; d) documenting of the design; e) proving the adequacy of the design; f) verifying that the design meets the requirements; g) issuing design information; and h) compiling and keeping the records. **5.3 Design Development** 5.3.1 Information obtained from previous experience, including designs and procurement, fabrication, construction, installation, commissioning, and operation, shall be obtained, identified, and evaluated for initiating improvements.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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See above.	***3. DESIGN PROCESS Cont'd*** *The final design (approved design output documents and approved changes thereto) shall:* *a) be relatable to the design input by documentation in sufficient detail to permit design verification; and* *b) identify assemblies and/or components that are part of the item being designed. When such an assembly or component part is a commercial grade item that, prior to its installation, is modified or selected by special inspection and/or testing to requirements that are more restrictive than the Supplier's published product description, the component part shall be represented as different from the commercial grade item in a manner traceable to a documented definition of the difference.*	**N286.2-00** **5.10 Design Records** 5.10.1 Design records shall include design documents that a) specify design requirement and sources of design input; b) contain technical information for fabrication, construction, installation, commissioning, operation, or decommissioning; c) substantiate the technical adequacy of the design; and d) are required for licensing purposes or to meet applicable codes and standards. **N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and\ l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	CSA N286.2 addresses essentially the same requirements as ASME NQA-1 regarding design inputs. CSA N286.2 and CSA N286.1 address essentially the same requirements as ASME NQA-1 regarding the linkage to manufacturing and the need for inspections, tests, acceptance criteria. ASME NQA-1 requires explicitly that the assemblies and/or components be identified that form part of an item. NQA-1 specifies how to treat a commercial grade item if part of such an assembly. The CSA N286 standards do not specify these requirements explicitly.	No Significant Difference; No Impact on the ACR QA Program. Not of any significant relevance to ACR design.

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	3.1 Design Analyses *Design analyses shall be performed in a planned, controlled, and documented manner. Design analysis documents shall be legible and in a form suitable for reproduction, filing, and retrieval. They shall be sufficiently detailed as to purpose, method, assumptions, design input, references, and units such that a person technically qualified in the subject can review and understand the analyses and verify the adequacy of the results without recourse to the originator. Calculations shall be identifiable by subject (including structure, system, or component to which the calculation applies), originator, reviewer, and date; or by other data such that the calculations are retrievable.*	**N286.2-00** **4.3 Work Planning** Design activities shall be planned so as to define a systematic progression of activities and work practices. Work plans shall be produced. **5.5 Design Adequacy** 5.5.1 Calculations, records, stress reports, and other formal documents produced as part of the design process, including analytical work, shall be prepared, verified, approved, and filed. 5.5.4 When analytical work is performed, the inputs, assumptions, methods, modeling, test and development work, and results shall be documented. **5.7 Verification Personnel** 5.7.1 Design verification shall be carried out by suitably qualified persons (including the designer's supervisor), provided they did not perform the activities or make the design decisions that are being verified. **5.10 Design Records** Design records shall be complete, legible, retrievable, and traceable to their related items and activities.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3.1 Design Analyses Cont'd *a) Computer programs may be utilized for design analysis without individual verification of the program for each application provided:* *1) the computer program has been verified to show that it produces correct solutions for the encoded mathematical model within defined limits for each parameter employed; and* ***2)*** *the encoded mathematical model has been shown to produce a valid solution to the physical problem associated with the particular application.*	**N286.2-00** **5.5 Design Adequacy** 5.5.2 The identification, use, validation, and revision of computer programs employed in the design process shall be controlled. Note: The quality assurance program requirements for design and analytical computer programs are defined in CSA Standard N286.7. 5.5.3 When computer programs are used in design or analytical work, the program description, instructions for use, validation reports, changes to the programs, and results shall be documented. **N286.7-99** **9. Validation** Validation shall provide information sufficient to permit the determination of appropriate uncertainty allowances with respect to the intended application. Examples of validation methods include comparison of the computer program results with a) experimental data; b) commissioning data and operating experience; c) results of hand calculations; d) solutions to standard or benchmark problems; e) closed mathematical solutions; and f) results of another validated computer program. Conclusions regarding validation shall take into account the accuracy of the information against which the computer program is being validated. Computer program validation results shall be reproducible and documented as specified in Clause 11.3.5. Computer program validation shall be performed by qualified persons. Validation reports shall be reviewed by qualified persons who did not participate in the validation (see Clause 1.3 for references to related requirements in the other N286 Standards).	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3.1 Design Analyses Cont'd *Computer programs shall be controlled to assure that changes are documented and approved by authorized personnel. Where changes to previously verified computer programs are made, verification shall be required for the change, including evaluation of the effects of these changes on (1) and (2) above.*	**N286.2-00** **5.5 Design Adequacy** 5.5.3 When computer programs are used in design or analytical work, the program description, instructions for use, validation reports, changes to the programs, and results shall be documented. **N286.7-99** **8. Change Control** The organization performing a change to a configuration component shall identify and have access to all information necessary to understand the purpose and design of the computer program version being changed, and shall implement a system to control changes. The system shall require that a) reasons for changes be identified; b) the version to be modified be specified and a new version identification proposed; c) changes be classified as significant or not, and justification provided (see Clause 5); d) proposed changes be reviewed and approved; e) a change control plan (i.e., development plan for changes) be produced for significant changes (see Clause 11.2.3); f) a requirements specification be produced for significant changes (see Clause 11.2.4); g) changes and their verification be documented, including an assessment of the impact of significant changes on other parts of the computer program (see Clause 11.3.6); and h) the new version be archived and released for use.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3.1 Design Analyses Cont'd *b) Documentation of design analyses shall include (1) through (6) below:* 1) *definition of the objective of the analyses;* 2) *definition of design inputs and their sources;* 3) *results of literature searches or other applicable background data;* 4) *identification of assumptions and indication of those that must be verified as the design proceeds;* 5) *identification of any computer calculation, including computer type, computer program (e.g., name), revision identification, inputs, outputs, evidence of or reference to computer program verification, and the bases (or reference thereto) supporting application of the computer program to the specific physical problem;* 6) *review and approval.*	**N286.2-00** **5.5 Design Adequacy** 5.5.4 When analytical work is performed, the inputs, assumptions, methods, modeling, test and development work, and results shall be documented. 5.5.2 The identification, use, validation, and revision of computer programs employed in the design process shall be controlled. Note: The quality assurance program requirements for design and analytical computer programs are defined in CSA Standard N286.7. 5.5.3 When computer programs are used in design or analytical work, the program description, instructions for use, validation reports, changes to the programs, and results shall be documented. **5.4 Documenting the Design** 5.4.6 For each type of design document, requirements shall be established for: a) format and presentation; b) identification; c) indication of status; d) verification and approval; e) revisions; f) issuance and distribution; and g) storage and retrieval of originals or masters.	CSA N286.2 does not specify any explicit requirements for documenting literature searches.	No Significant Difference; No Impact on the ACR QA Program. Literature searches are inherent in the AECL design process. Where appropriate, ACR documentation makes reference to the relevant publications.

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	3.1 Design Analyses Cont'd	**N286.7-99** **10.1 Requirements for Use** Each organization shall ensure the proper use of computer programs by requiring that computer programs are validated for the intended use; only those physical states are analyzed that are within the documented range of the computer program's applicability; the input data is verified to ensure that it adequately represents the physical system or process analyzed; the derivations and sources of input data are documented in a form that facilitates independent review; the configuration of the computer program and the input data are identified so that results can be reproduced; the results produced by the computer program are reviewed to confirm that they are reasonable; and user qualifications are specified and the necessary training is provided to minimize the effect of user dependency.	See above.	

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III. DESIGN CONTROL Cont'd The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. The verifying or checking process shall be performed by individuals or groups other than those who performed the original design, but who may be from the same organization. Design control measures shall be applied to items such as 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.	***4. DESIGN VERIFICATION*** *Design control measures shall be applied to verify the adequacy of 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. Verification of computer programs shall include appropriate testing. The responsible design organization shall identify and document the particular design verification method(s) used. The results of design verification shall be clearly documented with the identification of the verifier clearly indicated. 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. This verification may be performed by the originator's supervisor, provided the supervisor did not specify a singular design approach or rule out certain design considerations and did not establish the design inputs used in the design or, provided the supervisor is the only individual in the organization competent to perform the verification. Cursory supervisory reviews do not satisfy the intent of this Standard.* *Verification shall be performed in a timely manner. Design verification, for the level of design activity accomplished, shall be performed prior to release for procurement, manufacture, construction, or release to another organization for use in other design activities except in those cases where this timing cannot be met, such as when insufficient data exist. In those cases, the unverified portion of the design shall be identified and controlled. In all cases the design verification shall be completed prior to relying upon the component, system, structure, or computer program to perform its function.*	**N286.2-00** **4.5 Verification Planning** 4.5.1 The design organization shall plan and carry out verification of each design and its revisions. 4.5.2 Plans for verification shall identify a) the design activities to be verified; b) the nature and extent of the verification; c) the individual verifier, review committee, or qualified independent party, as applicable; d) the verification method(s), including the method of reporting and follow-up; and e) the position of the verification activities in the design cycle. **5.6 Design Verification** 5.6.3 Design verification methods include design review, alternative analyses, and qualification testing. The documents reporting the results of the alternative analyses or qualification testing shall be reviewed for adequacy and relevancy to complete the verification process. 5.6.7 Computer programs that are to be used to control plant systems shall be verified to a documented plan that defines the a) test method to be used; b) input to be processed; and c) output acceptance criteria. The development of such computer programs shall be in accordance with a quality assurance Standard. **5.7 Verification Personnel** 5.7.1 Design verification shall be carried out by suitably qualified persons (including the designer's supervisor), provided they did not perform the activities or make the design decisions that are being verified.	The CSA N286 series of standards does not permit the exception in ASME NQA-1, Clause 4, 2nd paragraph, to release design documents for use which have some parts not duly verified. The more stringent requirements of the CSA N286 series of standards would have to be relaxed in order to accommodate the provisions of ASME NQA-1, Clause 4, 2nd paragraph.	No Significant Difference; No Impact on the ACR QA Program.

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See above.	See above.	**N286.2-00 Cont'd** **5.7 Verification Personnel** 5.7.2 The designer's supervisor shall be responsible for ensuring the design work is correct, that it meets requirements, and that the required verification is done. 5.7.3 Line supervision shall be responsible for ensuring that the design is adequately verified, including confirmation that planned verification activities have been completed, before approving design output document.	See above.	
	4.1 Extent of Design Verification *The extent of the design verification required is a function of the importance to safety, the complexity of the design, the degree of standardization, the state of the art, and the similarity with previously proven designs. Where the design has been subjected to a verification process in accordance with this Part (Part I), the verification process need not be duplicated for identical designs. However, the applicability of standardized or previously proven designs, with respect to meeting pertinent design inputs, shall be verified for each application. Known problems affecting the standard or previously proven designs and their effects on other features shall be considered. The original design and associated verification measures shall be adequately documented and referenced in the files of subsequent application of the design.*	**N286.2-00** **3.7 Use of Experience** A process shall be established so that experience in design, construction, operation, and decommissioning of nuclear plants shall be a) obtained, identified, and provided to users; and b) assessed for use in improving i) plant and equipment performance; and ii) operating requirements and practices. **3.10 Verification** Each design and its revisions shall be verified according to the requirements of Clauses 4.5 and 5.6. Verification results shall be documented. **5.6 Design Verification** 5.6.1 The nature and extent of verification of design document shall be determined based on the following criteria: a) the impact on safety; b) the complexity of the design; c) the degree of standardization; d) the state of the art; and e) the similarity to previously proven designs. Design requirement shall also be verified when they are a design output. 5.6.2 When a previously finished and verified design is to be used for a new application, design verification need only confirm that: a) the application of the design is correct; and b) the analyses are still valid.	CSA N286.2-00 does not have an explicit requirement that the original design and associated verification documentation shall be referenced in records of subsequent application of the design, as specified in ASME NQA-1, Clause 4.1.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	4.1 Extent of Design Verification Cont'd *Where changes to previously verified designs have been made, design verification shall be required for the changes, including evaluation of the effects of those changes on the overall design and on any design analyses upon which the design is based that are affected by the change to previously verified design.*	**N286.2-00** **5.9 Design Changes** 5.9.2 Changes shall be subject to a process of review and approval similar to that applied to the original design.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	4.2 Methods *Acceptable verification methods include, but are not limited to, any one or a combination of the following: design reviews, alternate calculations, and qualification testing.*	**N286.2-00** **5.6 Design Verification** 5.6.3 Design verification methods include design review, alternative analyses, and qualification testing. The documents reporting the results of the alternative analyses or qualification testing shall be reviewed for adequacy and relevancy to complete the verification process.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	4.2.1 Design Reviews*. These are critical reviews to provide assurance that the final design is correct and satisfactory. Where applicable, (a) through (f) below shall be addressed.* *a) Were the design inputs correctly selected?* *b) Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?* *c) Was an appropriate design method used?* *d) Were the design inputs correctly incorporated into the design?* *e) Is the design output reasonable compared to design inputs?* *f) Are the necessary design input and verification requirements for interfacing organizations specified in the design documents or in supporting procedures or instructions?*	**N286.2-00** **5.6 Design Verification** 5.6.4 The scope of the design review shall be defined. The purpose of design reviews is to confirm that the design meets the design requirements and that design documents are correct and satisfactory. This review may be made as a group review or a single-person review. Note: A non-mandatory list of design review considerations is given in Appendix D.	The specific requirements of ASME NQA-1, Clause 4.2.1 (a) through (f) are addressed in CSA N286.2-00 among the items listed in Appendix D, Design Review List. However, this appendix in CSA N286.2 is not mandatory.	Significant Difference; Some Impact on the ACR QA Program. ACR QA Program to review the Design Review procedure and ensure that the requirements of Clause 4.2.1 of Supplementary 3S-1 are met.

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	4.2 Methods Cont'd ***4.2.2 Alternate Calculations.*** *These are calculations or analyses that are made with alternate methods to verify correctness of the original calculations or analyses. The appropriateness of assumptions, input data used, and the computer program or other calculation method used shall also be reviewed.*	**N286.2-00** **5.6 Design Verification** 5.6.5 The purpose of alternative analyses is to check the validity of design calculations. Such analyses employ simplified calculations and assumptions to yield approximate results. Differences in results shall be reviewed, and the acceptability of the original calculations shall be justified. The alternative analyses, assumptions, and results shall be documented. **N286.7-99** **10 Use of Computer Programs** **10.1 Requirements for Use** Each organization shall ensure the proper use of computer programs by requiring that a) computer programs are validated for the intended use; b) only those physical states are analyzed that are within the documented range of the computer program's applicability; c) the input data is verified to ensure that it adequately represents the physical system or process analyzed; d) the derivations and sources of input data are documented in a form that facilitates independent review; e) the configuration of the computer program and the input data are identified so that results can be reproduced; f) the results produced by the computer program are reviewed to confirm that they are reasonable; and g) user qualifications are specified and the necessary training is provided to minimize the effect of user dependency.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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III. DESIGN CONTROL Cont'd Where a test program is used to verify the adequacy of a specific design feature in lieu of other verifying or checking processes, it shall include suitable qualifications testing of a prototype unit under the most adverse design conditions	***4.2 Methods Cont'd*** ***4.2.3 Qualification Tests.*** *Where design adequacy is to be verified by qualification tests, the tests shall be identified. The test configuration shall be clearly defined and documented. Testing shall demonstrate adequacy of performance under conditions that simulate the most adverse design conditions. Operating modes and environmental conditions in which the item must perform satisfactorily shall be considered in determining the most adverse conditions. Where the test is intended to verify only specific design features, the other features of the design shall be verified by other means. Test results shall be documented and evaluated by the responsible design organization to assure that test requirements have been met.* *If qualification testing indicates that modifications to the item are necessary to obtain acceptable performance, the modification shall be documented and the item modified and retested or otherwise verified to assure satisfactory performance. When tests are being performed on models or mockups, scaling laws shall be established and verified. The results of model test work shall be subject to error analysis, where applicable, prior to use in final design work.*	**N286.2-00** **5.6 Design Verification** 5.6.6 The purpose of qualification testing a prototype or initial production unit is to verify the design or specific design features. In the case of the latter, the other features of the design shall be verified by other means. Reports of such qualification testing shall be reviewed for validity and for relevancy to design requirements. Organizations performing qualification testing shall have a qualification testing program that meet the requirements of Clause 6. **6.7.2 Test Program** A document shall be produced that gives directly or by reference a) a list of test to be performed; b) the objectives of the tests; c) the test conditions; d) the acceptance criteria; e) the reports required; and f) other essential information. **6.7.9 Test Reports** Test report shall be prepared. Test report requirement shall be established for: a) format and presentations; b) identification; c) content, including information on the test pieces, the test performed, the data collected, and the conclusions drawn from the result obtained; d) indication of status; e) verification and approval; f) revisions; g) issuance and distribution; and h) storage and retrieval of originals and masters.	Both standards have essentially similar requirements. However, ASME NQA-1 specifies explicitly particular requirements when tests are performed on models or mock-ups to: • Testing shall demonstrate adequacy of performance under the most adverse design conditions; • Establish and verify scaling laws; • Apply error analysis, where applicable, to the results of model test work, prior to use in final design work.	No Significant Difference; No Impact on the ACR QA Program. Significant Difference; Some Impact on the ACR QA Program; ACR QA Program to ensure that qualification testing shall demonstrate adequacy of performance under the most adverse design conditions; establish and verify scaling laws; apply error analysis, where applicable, to the results of model test work, prior to use in final design work. Review the qualification test specification procedure (CVS) and revise as appropriate.

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III. DESIGN CONTROL Cont'd Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization.	***5. CHANGE CONTROL*** *Changes to final designs, field changes, modifications to operating facilities, and nonconforming items dispositioned use-as-is or repair shall be justified and subject to design control measures commensurate with those applied to the original design. These measures shall include assurance that the design analyses for the structure, system, or component are still valid. Changes shall be approved by the same affected groups or organizations which reviewed and approved the original design documents; except where an organization which originally was responsible for approving a particular design document is no longer responsible, then the Owner or his designee shall designate a new responsible organization which could be the Owner's engineering organization. The designated organization shall have demonstrated competence in the specific design area of interest and have an adequate understanding of the requirements and intent of the original design.*	**N286.2-00** **3.13 Change Control** Changes to approved design requirements, designs, design documents, analytical tools, processes and practices shall be reviewed and approved by persons who are qualified to evaluate them against the original and current requirements. See Clause 5.9 for the detailed requirements. 5.9.2 Changes shall be subject to a process of review and approval similar to that applied to the original design. 5.9.3 A change and the reason(s) for it shall be documented. When a significant change is required because the design is incorrect, the design and verification activities shall be reviewed and modified as necessary. **N286.5-95** **3.3 Organization and Responsibilities** 3.3.4 The organization responsible for review and approval of changes to the design of the plant shall be identified. This organization shall be a competent group designated by the owner. **N286.5-95** **3.13 Change Control** 3.13.1 Permanent and temporary changes to accepted designs, items, computer software, processes and practices shall be a) reviewed and approved before they are implemented; b) reviewed and approved by persons who have full knowledge of the original and current intent and requirements; and c) documented.	Both standards have essentially similar requirements. See also the provisions in the row below.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.5-95** **6.5 Design Changes** 6.5.1 Permanent changes to systems, equipment, and software shall be controlled. The following requirements shall be addressed: a) Design changes shall be performed in accordance with the requirements of CSA Standard N286.2 and any other applicable code, standard or regulation. These requirements may be included in the operations quality assurance manual. b) Activities related to change control including design, procurement of original parts, installation, testing, and document updates shall be effectively coordinated among responsible groups. c) Design changes shall be reviewed and approved by a competent group designated by the owner. This group must have access to pertinent background information and understand the requirements and intent of the design. This group shall include as appropriate, various disciplines of design, nuclear safety, radiation safety, chemistry, operations and maintenance. As a minimum, a review shall be done during early design and prior to installation. d) Installation of the change shall be controlled by procedures. e) Changed systems, equipment, and software shall be commissioned and tested. f) Documents and training programs shall be revised in a timely manner to reflect the change. Details and ramifications of the change shall be communicated to staff prior to implementation.	See above.	

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	5. CHANGE CONTROL Cont'd *When a design change is approved other than by revision to the affected design documents, measures shall be established to incorporate the change into these documents, where such incorporation is appropriate.*		The CSA N286 series of standards does not provide for approving design changes by means other than by revision of affected design documents. Unique NQA-1 requirements are that design changes are incorporated into the applicable design documents, when a design change is approved other than by revision to the affected design documents.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	5. CHANGE CONTROL Cont'd *Where a significant design change is necessary because of an incorrect design, the design process and verification procedure shall be reviewed and modified as necessary.*	**N286.2-00** **5.9 Design Changes** 5.9.3 A change and the reason(s) for it shall be documented. When a significant change is required because the design is incorrect, the design and verification activities shall be reviewed and modified as necessary.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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III. DESIGN CONTROL Cont'd Measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations. These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces.	***6. INTERFACE CONTROL*** *Design interfaces shall be identified and controlled and the design efforts shall be coordinated among the participating organizations. Interface controls shall 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 shall be documented and controlled. Transmittals shall identify the status of the design information or document provided and, where necessary, identify incomplete items which require further evaluation, review, or approval. Where it is necessary to initially transmit design information orally or by other informal means, the transmittal shall be confirmed promptly by a controlled document.*	**N286.2-00** **3.6 Communication** 3.6.1 Organizational interfaces shall be identified, communicated, and controlled for effective work integration. Design interfaces shall be identified a) between departments within the design organization; and b) between the design organization and i) its client; and ii) other organizations with related responsibilities. 3.6.2 Interface control shall include the establishment of procedures for the identification, review, approval, release, distribution, and revision of documents that cross-organizational boundaries. 3.6.3 The design organization shall manage essential information. It shall a) identify what information is needed; b) identify who needs it; c) distribute the information; and d) ensure that the distributed information is current, correct, and timely. rfaces with organizations involved with other phases of stablished. **5.8 Issue of Design Information** 5.8.1 Design information, including changes, shall be communicated from one organization to another, and within an organization, by controlled documents that are uniquely identified, approved for release, and issued by authorized persons. 5.8.2 Procedures shall be established to manage the production and issuance of design output documents. 5.8.3 Document and their revisions shall be issued to all areas in which they are required. olete documents shall be identified and promptly remov re their inadvertent use could affect quality.	CSA N286.2-00 generally has more detailed requirements than ASME NQA-1-1994 in the area of interface control. However, CSA N286.2-00 does not permit the **oral transmittal** of design information.	No Significant Difference; No Impact on the ACR QA Program. ACR QA Program practices allow use of verbal transmittal of design information, followed by written acknowledgement.

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	7. DOCUMENTATION AND RECORDS *Design documentation and records, which provide evidence that the design and design verification processes were performed in accordance with the requirements of this Part (Part I), shall be collected, stored, and maintained in accordance with documented procedures.* *The documentation shall include not only final design documents, such as drawings and specifications, and revisions thereto but also documentation which identifies the important steps, including sources of design inputs that support the final design.*	**N286.2-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents and analytical tools shall be controlled. See Clauses 5.8 and 5.9 for the detailed requirements. 3.14.2 Information that identifies changes and revisions to documents or analytical tools shall be maintained. **3.15 Records** 3.15.1 Design records and design assurance records shall be maintained. Requirements for design records are given in Clause 5.10. Requirements for design assurance records are given in Clauses 3.15.2 - 3.15.5. **5.10 Design Records** 5.10.1 Design records shall include design documents that a) specify design requirement and sources of design input; b) contain technical information for fabrication, construction, installation, commissioning, operation, or decommissioning; c) substantiate the technical adequacy of the design; and d) are required for licensing purposes or to meet applicable codes and standards.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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IV. PROCUREMENT DOCUMENT CONTROL Measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements 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. To the extent necessary, procurement documents shall require contractors or subcontractors to provide a quality assurance program consistent with the pertinent provisions of this appendix.	**BASIC REQUIREMENT 4: PROCUREMENT DOCUMENT CONTROL** Applicable design bases and other requirements necessary to assure adequate quality shall be included or referenced in documents for procurement of items and services. To the extent necessary, procurement documents shall require Suppliers to have a quality assurance program consistent with the applicable requirements of this Part (Part I).	**N286.1-00** **4.2 Identification of Requirements** 4.2.1 Measures shall be established for ensuring that the requisitioning documents reference or define the scope of work and describe the item or service, including the following: a) technical performance requirements; b) regulatory requirements; and c) codes, standards, and specifications referenced in approved design documents.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 4S-1 ***Supplementary Requirements for Procurement Document Control*** ***1. GENERAL*** *This Supplement provides amplified requirements for procurement document control. It supplements the requirements of Basic Requirement 4 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below
	2. CONTENT OF THE PROCUREMENT DOCUMENTS *Procurement documents issued at all tiers of procurement shall include provisions for the following, as deemed necessary by the Purchaser.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.1 Measures shall be established to ensure that all requirements are identified and made known to potential contractors.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.1 Scope of Work *A statement of the scope of the work to be performed by the Supplier shall be in the procurement documents.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.2 Technical Requirements *Technical requirements shall be specified in the procurement documents. Where necessary, these requirements shall be specified by reference to specific drawings, specifications, codes, standards, regulations, procedures, or instructions, including revisions thereto that describe the items or services to be furnished. The procurement documents shall provide for identification of test, inspection, and acceptance requirements of the Purchaser for monitoring and evaluating the Supplier's performance.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.3 Quality Assurance Program Requirements *Procurement documents shall require that the Supplier have a documented quality assurance program that implements portions or all of the requirements of this Part (Part I). The extent of the program required shall depend upon the type and use of the item or service being procured. The procurement documents shall require the Supplier to incorporate appropriate quality assurance program requirements in subtler procurement documents.*	**N286.1-00** **4.2 Identification of Requjirements** 4.2.4 When items or services are procured from non-participant organizations and a quality assurance program is required, an appropriate quality assurance Standard, such as the CSA 7299 Series of Standards, the ISO 9000 Series of Standards, ASME Standard NQA-1, or IAEA Publications 50-SG-QA3 and QA8, shall be specified. **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.4 Right of Access *At each tier of a procurement, the procurement documents shall provide for access to the Supplier's plant facilities and records for inspection or audit by the Purchaser, his designated representative, and/or other parties authorized by the Purchaser.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records. **4.7 Contract Administration** 4.7.6 Contractors' performance shall be monitored and the results recorded.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.5 Documentation Requirements *The procurement documents at all tiers shall identify the documentation required to be submitted for information, review, or approval by the Purchaser. The time of submittal shall also be established. When the Purchaser requires the Supplier to maintain specific quality assurance records, the retention times and disposition requirements shall be prescribed.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.6 Nonconformances *The procurement documents shall include Purchaser's requirements for reporting and approving disposition of nonconformances.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	2.7 Spare and Replacement Parts *The procurement documents shall require the identification of appropriate spare and replacement parts or assemblies and the appropriate delineation of the technical and quality assurance related data required for ordering these parts or assemblies.*		The CSA N286 series of standards does not explicitly address this requirement in ASME NQA-1-1994, Basic Requirement 4, Clause 2.7.	Significant Difference; Some Impact on the ACR QA Program; Not applicable for the ACR Design Certification phase.

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	3. PROCUREMENT DOCUMENT REVIEW *A review of the procurement documents and changes thereto shall be made to assure that documents transmitted to the prospective Supplier(s) include appropriate provisions to assure that items or services will meet the specified requirements.* *Reviews shall be performed and documented to provide objective evidence of satisfactory accomplishment of such review prior to contract award.* *Changes made as a result of the bid evaluations or pre-contract negotiations shall be incorporated into the procurement documents. The review of such changes and their effects shall be completed prior to contract award. This review shall include the following considerations:* *a) appropriate requirements specified in Section 2 of this Supplement;* *b) determination of any additional or modified design criteria;* *c) analysis of exceptions or changes requested or specified by the Supplier and determination of the effects such changes may have on the intent of the procurement documents or quality of the item or service to be furnished.* *Reviews required by this Section shall be performed by personnel who have access to pertinent information and who have an adequate understanding of the requirements and intent of the procurement documents.*	**N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **3.13 Change Control** Changes to processes, practices, and documents shall be a) reviewed and approved before they are implemented by persons who have full knowledge of the original intent and requirements; and b) documented. **4.6 Bid Evaluation and Contract Award** 4.6.3 Prior to the award of a contract, any exceptions to the requirements and any unacceptable conditions related to quality, revealed by the bid evaluation, shall be resolved, or a commitment to resolve unacceptable conditions shall be obtained. 4.6.4 The contract award documentation shall identify changes required as a result of the bid evaluation or pre-contract negotiations and shall contain or reference the requirements listed in Clause 4.3.2.	Both standards have similar requirements. However, the N286 series of standards does not specify the detailed requirements for the review of procurement documents specified in ASME NQA-1-1994, Basic Requirement 4, Clause 3, items (a) through (c).	Significant Difference; No impact on the ACR QA Program. Procurement documents are modified through Technical Document Lists (TDLs), and the referenced documents are reviewed as per the normal review process.
	4. PROCUREMENT DOCUMENT CHANGES *Procurement document changes shall be subject to the same degree of control as utilized in the preparation of the original documents.*	**N286.1-00** **3.13 Change Control** Changes to processes, practices, and documents shall be a) reviewed and approved before they are implemented by persons who have full knowledge of the original intent and requirements; and b) documented.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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V. INSTRUCTIONS, PROCEDURES, AND DRAWINGS Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.	**BASIC REQUIREMENT 5: INSTRUCTIONS, PROCEDURES, AND DRAWINGS** Activities affecting quality shall be prescribed by and performed in accordance with documented instructions, procedures, or drawings of a type appropriate to the circumstances. These documents shall include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished.	**N286.0-92** **11. Control of Items, Processes, and Practices** 11.1 The owner shall ensure that second-tier measures are established so that only specified and accepted items, processes, and practices are used; and items, processes, and practices meet the requirements of applicable Standards. **N286.1-00** **3.9 Control of Processes and Practices** Procurement processes and practices shall be specified and documented. **N286.2-00** **3.9 Control of Processes and Practices** 3.9.1 Only specified and accepted processes and practices shall be used. See Clause 5 for the detailed requirements. 3.9.2 Processes and practices shall meet the requirements of applicable Standards.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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VI. DOCUMENT CONTROL Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall 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. Changes to documents shall be reviewed and approved by the same organizations that performed the original review and approval unless the applicant designates another responsible organization.	**BASIC REQUIREMENT 6: DOCUMENT CONTROL** 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 employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel.	**N286.0-92** **16. Document Control** 16.1 The owner shall ensure overall and second-tier measures are established so that a) essential documents and their use are identified; b) preparation, review, approval, issue, and revision of documents are controlled; c) current documents are available to the users; and d) obsolete documents are not used. **N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled. 3.14.2 Revisions to documents shall be identified. **N286.2-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents and analytical tools shall be controlled. See Clauses 5.8 and 5.9 for the detailed requirements. 3.14.2 Information that identifies changes and revisions to documents or analytical tools shall be maintained.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	SUPPLEMENT 6S-1 ***Supplementary Requirements for Document Control*** ***1. GENERAL*** *This Supplement provides amplified requirements for a document control system. It supplements the requirements of Basic Requirement 6 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).* *The documents which shall be controlled in accordance with this Supplement are only those documents which specify quality requirements or prescribe activities affecting quality such as instructions, procedures, and drawings.* *The term document control used throughout this Supplement is defined as the act of assuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. DOCUMENT PREPARATION, REVIEW, APPROVAL, AND ISSUANCE *The control system shall be documented and shall provide for (a) through (c) below:* *a) identification of documents to be controlled and their specified distribution;* *b) identification of assignment of responsibility for preparing, reviewing, approving, and issuing documents;* *c) review of documents for adequacy, completeness, and correctness prior to approval and issuance.*	**N286.0-92** **12 Verification** 12.1 The owner shall ensure that second-tier measures are established so that: a) required verification activities are identified, planned, executed, and documented; b) the method, extent, and timing of the verification and the identity of the verifiers are recorded; and c) verification of work is appropriately independent from performance of the work. **16. Document Control** 16.1 The owner shall ensure overall and second-tier measures are established so that a) essential documents and their use are identified; b) preparation, review, approval, issue, and revision of documents are controlled; c) current documents are available to the users; and d) obsolete documents are not used. **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.10 Verification** 3.10.1 The identity of the verifiers shall be documented. 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity.	Both standards have similar requirements. However, the CSA N286 series of standards has only a general requirement with respect to the assignment of responsibilities for all activities rather than just for preparation, review, approval, etc. of documents. Unique NQA-1 requirements are: • Identification of documents to be controlled and their specified distribution; • Identification of assignment of responsibility for preparing, reviewing, approving, and issuing documents; • Review of documents for adequacy, completeness, and correctness prior to approval and issuance.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled. 3.14.2 Revisions to documents shall be identified. **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the item and activity to which they refer. **N286.2-00** **3.10 Verification** Each design and its revisions shall be verified according to the requirements of Clauses 4.5 and 5.6. Verification results shall be documented. **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents and analytical tools shall be controlled. See Clauses 5.8 and 5.9 for the detailed requirements. 3.14.2 Information that identifies changes and revisions to documents or analytical tools shall be maintained. **5.10 Design Records** 5.10.2 Complete and up-to-date listings of design records and their status shall be maintained. 5.10.3 Design records shall be complete, legible, retrievable, and traceable to their related items and activities.		

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	3. DOCUMENT CHANGES ***3.1 Major Changes*** *Changes to documents, other than those defined as minor changes in para. 3.2 below, are considered as major changes and shall be reviewed and approved by the same organizations that performed the original review and approval unless other organizations are specifically designated. The reviewing organization shall have access to pertinent background data or information upon which to base their approval.*	**N286.0-92** **15. Change Control** 15.1 The owner shall ensure that second-tier measures are established so that a) permanent and temporary changes to accepted designs, items, processes, and practices are reviewed and approved before they are implemented; b) review and approval of changes to accepted designs, items, processes, and practices are made by persons who have full knowledge of the original intent and requirements; and c) changes are documented. **N286.2-00** **3.13 Change Control** Changes to approved design requirements, designs, design documents, analytical tools, processes and practices shall be reviewed and approved by persons who are qualified to evaluate them against the original and current requirements. See Clause 5.9 for the detailed requirements. **5.9 Design Changes** 5.9.2 Changes shall be subject to a process of review and approval similar to that applied to the original design.	The CSA N286 series of standards does not provide for a distinction between major and minor document changes. For major changes both standards have similar requirements.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	3.2 Minor Changes *Minor changes to documents, such as inconsequential editorial corrections, shall not require that the revised documents receive the same review and approval as the original documents. To avoid a possible omission of a required review, the type of minor changes that do not require such a review and approval and the persons who can authorize such a decision shall be clearly delineated.*		The CSA N286 series of standards has no requirements for the control of minor changes. All changes are subject to the same controls.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery.	**BASIC REQUIREMENT 7: CONTROL OF PURCHASED ITEMS AND SERVICES** The procurement of items and services shall be controlled to assure conformance with specified requirements. Such control shall provide 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 completion.	**N286.1-00** **1. Scope** 1.1 This Standard contains requirements for the quality assurance program applicable to procurement for a nuclear power plant and is the governing Standard for procurement quality assurance activities. 1.2 This Standard is addressed to the owner and is applicable to procurement activities carried out by both the owner and participants designated by the owner. 1.3 This Standard applies to the procurement of safety-related items and services during all constituent phases of the power plant's life, from design through decommissioning. It may be applied to other items or services at the discretion of the owner. 1.4 All of the requirements in this Standard apply; however, the extent of application may vary according to the degree of potential impact on the safety of the plant.	Both standards have similar requirements. Specific requirements for source evaluation and selection, source inspection, etc. are addressed in the body of CSA N286.1-00.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 7S-1 ***Supplementary Requirements for Control of Purchased Items and Services*** ***1. GENERAL*** *This Supplement provides amplified requirements for control of purchased items and services. It supplements the requirements of Basic Requirement 7 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I). This Supplement includes requirements for source selection, bid evaluation, Supplier performance evaluation, and verification of conformance.*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. PROCUREMENT PLANNING *Procurement activities shall be planned and documented to assure a systematic approach to the procurement process. Procurement planning shall result in the documented identification of procurement methods and organizational responsibilities.* *Planning shall determine the following:* *a) what is to be accomplished;* *b) who is to accomplish it;* *c) how it is to be accomplished;* *d) when it is to be accomplished.* *Planning shall be accomplished as early as practicable, and no later than at the start of those procurement activities which are required to be controlled, to assure interface compatibility and a uniform approach to the procurement process.* *Planning shall result in the documented identification of methods to be used in procurement activities, sequence of actions and milestones indicating the completion of these activities, and the preparation of applicable procedures prior to the initiation of each individual activity listed below. Planning shall provide for the integration of (a) through (i) below:* *a) procurement document preparation, review, and change control;* *b) selection of procurement sources;* *c) bid evaluation and award;* *d) Purchaser control of Supplier performance;* *e) verification (surveillance, inspection, or audit) activities by Purchaser, including notification for hold and witness points;* *f) control of nonconformances;* *g) corrective action;* *h) acceptance of item or service;* *i) quality assurance records.*	**N286.1-00** **3.3 Organization and Responsibilities** 3.3.1 The owners and participants shall define and document the a) organizational structure; b) functional responsibilities; c) levels of authority; and d) internal and external interfaces. **3.8 Work Planning and Control** Activities shall be defined, planned, sequenced, assigned, controlled, verified, and documented. **3.9 Control of Processes and Practices** Procurement processes and practices shall be specified and documented. **4.1 Overall Procurement Control** Procurement activities shall be planned, performed, and documented so as to satisfy the requirements of Clauses 4.2-4.9, while being guided by the basic requirements of Clauses 3.1-3.16. **4.2 Identification of Requirements** 4.2.1 Measures shall be established for ensuring that the requisitioning documents reference or define the scope of work and describe the item or service, including the following: technical performance requirements; regulatory requirements; and codes, standards, and specifications referenced in approved design documents.	The CSA N286 series of standards does not specify a specific requirement to the effect that planning shall be accomplished as early as practicable, and no later than at the start of those procurement activities which are required to be controlled, to assure interface compatibility and a uniform approach to the procurement process.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the AECL Procurement QA Program which is followed by ACR.

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	3. SUPPLIER SELECTION ***3.1 Source Evaluation and Selection*** *The selection of Suppliers shall be based on evaluation of their capability to provide items or services in accordance with the requirements of the procurement documents prior to award of contract.* *Procurement source evaluation and selection measures shall be implemented by the Purchaser and shall provide for identification of the Purchaser's organizational responsibilities for determining Supplier capability.* *Measures for evaluation and selection of procurement sources, and the results therefrom, shall be documented and shall include one or more of (a) through (c) below:* *a) evaluation of the Supplier's history of providing an identical or similar product which performs satisfactorily in actual use. The Supplier's history shall reflect current capability.* *b) Supplier's current quality records supported by documented qualitative and quantitative information which can be objectively evaluated;* *c) Supplier's technical and quality capability as determined by a direct evaluation of his facilities and personnel and the implementation of his quality assurance program.*	**N286.1-00** **3.3 Organization and Responsibilities** 3.3.1 The owners and participants shall define and document the a) organizational structure; b) functional responsibilities; c) levels of authority; and d) internal and external interfaces. **4.1 Overall Procurement Control** Procurement activities shall be planned, performed, and documented so as to satisfy the requirements of Clauses 4.2-4.9, while being guided by the basic requirements of Clauses 3.1-3.16. **4.4 Evaluation and Selection of Contractors** 4.4.1 Measures shall be established for the evaluation and selection of contractors. 4.4.2 The selection of a contractor shall be based on: a) an evaluation of the contractor's ability to supply an acceptable product or service; b) the contractor's quality assurance program and its level of implementation; and c) when available, the contractor's history of supplying acceptable items or services.	Both standards have similar requirements. Note that N286-1-00 has a more stringent requirement for the selection of suppliers in Clause 4.4.2 in that all three criteria have to be considered. NQA-1-1994 requires only that one or more of the criteria be applied.	See above

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	4. BID EVALUATION *Bid evaluation shall determine the extent of conformance to the procurement documents. This evaluation shall be performed by individuals or organizations designated to evaluate the following subjects, as applicable to the type of procurement:* *a) technical considerations* *b) quality assurance requirements* *c) Supplier's personnel* *d) Supplier's production capability* *e) Supplier's past performance* *f) alternates* *g) exceptions* *Prior to the award of the contract, the Purchaser shall resolve or obtain commitments to resolve unacceptable quality conditions resulting from the bid evaluation.*	**N286.1** **4.6 Bid Evaluation and Contract Award** 4.6.1 Measures shall be established for bid evaluation and contract award. 4.6.2 The bid evaluation shall confirm a) the contractor's accreditation, or capability of accreditation, by relevant authorities for contractors of items with code and jurisdictional requirements; and b) that products or services offered meet technical requirements, which include safety, reliability, maintainability, and quality assurance requirements. 4.6.3 Prior to the award of a contract, any exceptions to the requirements and any unacceptable conditions related to quality, revealed by the bid evaluation, shall be resolved, or a commitment to resolve unacceptable conditions shall be obtained. 4.6.4 The contract award documentation shall identify changes required as a result of the bid evaluation or pre-contract negotiations and shall contain or reference the requirements listed in Clause 4.3.2. 4.6.5 The bid evaluation results and the basis for selection and award shall be recorded.	Note that ASME NQA-1 does not specify requirements for preparing invitations to bid, as does CSA N286.1-00 in Clause 4.3. With respect to bid evaluation, both standards have similar requirements. However, CSA N286.1-00 does not have an explicit requirement for the evaluation of bids using the criteria listed in ASME NQA-1-1994, Basic Requirement 7, Clause 4, items (a) to (g)	See above See above

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VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES Cont'd The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services.	4. . ***SUPPLIER PERFORMANCE EVALUATION*** *The Purchaser of items and services shall establish measures to interface with the Supplier and to verify Supplier's performance as deemed necessary by the Purchaser. The measures shall include (a) through (f) below:* *a) establishing an understanding between Purchaser and Supplier of the provisions and specifications of the procurement documents;* *b) requiring the Supplier to identify planning techniques and processes to be utilized in fulfilling procurement document requirements;* *c) reviewing Supplier documents which are generated or processed during activities fulfilling procurement requirements;* *d) identifying and processing necessary change information;* *e) establishing method of document information exchange between Purchaser and Supplier;* *f) establishing the extent of source surveillance and inspection activities.* *These verification activities shall be conducted as early as practicable. The Purchaser's verification activities, however, shall not relieve the Supplier of his responsibilities for verification of quality achievement.*	**N286.1-00** **4.6 Bid Evaluation and Contract Award** 4.6.4 The contract award documentation shall identify changes required as a result of the bid evaluation or pre-contract negotiations and shall contain or reference the requirements listed in Clause 4.3.2. **4.7 Contract Administration** 4.7.1 Measures shall be established for the administration and control of contracts. 4.7.2 Contractor documentation submitted for approval shall be reviewed and accepted by qualified personnel. 4.7.3 Provision shall be made for receipt, recording, collection, storage, maintenance, retention, and distribution of procurement records and documents submitted by contractors. 4.7.4 Changes affecting contractual, technical, and/or quality requirements made by either the contractor or the owner or participant shall be identified in writing and accepted by both the owner or participant and the contractor. 4.7.6 Contractors' performance shall be monitored and the results recorded.	The N286 series of standards does not specify a requirement for the supplier to identify planning techniques and processes to be utilized in fulfilling procurement document requirements, as required in ASME NQA-1-1994, Basic Requirement 7, Clause 5 (b). The N286 series of standards does not specify a requirement for document information exchange from the purchaser to the supplier, as suggested by the wording in ASME NQA-1-1994, Basic Requirement 7, Clause 5 (e). The N286 series of standards does not specify a requirement that verification activities be conducted as early as practicable, as specified in ASME NQA-1-1994, Basic Requirement 7, Clause 5, last paragraph. The N286 series of standards does not specify a requirement that the purchaser's verification activities do not relieve the supplier from the responsibility to verify quality achievement.	See above See above See above See above

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	5.1 Extent of Activities *The extent of verification activities, including planning, shall be a function of the relative importance, complexity, and quantity of the item or services procured and the Supplier's quality performance. Verification activities shall be accomplished by qualified personnel assigned to check, inspect, audit, or witness the activities of Suppliers.*	**N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **4.8 Verification of Purchased Items and Services** 4.8.3 The extent of verification shall be directly proportional to the safety-related function of the item or service, the complexity of manufacturing the item or providing the service, and (if available) the contractor's performance history. In addition, applicable jurisdictional and regulatory verification requirements shall be identified and satisfied.	The N286 series of standards does not include the quantity of items or services as a criterion to determine the extent of verification activities.	See above
	5.2 Records *Activities performed to verify conformance to requirements of procurement documents shall be recorded. Source surveillances and inspections, audits, receiving inspections, nonconformances, dispositions, waivers, and corrective actions shall be documented.* *The Purchaser shall assure that his documentation is evaluated to determine the Supplier's quality assurance program effectiveness.*	**N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **4.8 Verification of Purchased Items and Services** 4.8.2 Verification shall be planned, documented, and carried out by the owner or participant to ensure that items and/or services meet the requirements of the contract.	The N286 series of standards does not specify a requirement to evaluate the purchaser's verification documentation, in order to determine the supplier's QA program effectiveness.	See above

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VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES Cont'd Documentary evidence that material and equipment conform to the procurement requirements shall be available at the nuclear power plant or fuel reprocessing plant site prior to installation or use of such material and equipment. This documentary evidence shall be retained at the nuclear power plant or fuel reprocessing plant site and shall be sufficient to identify the specific requirements, such as codes, standards, or specifications, met by the purchased material and equipment.	***6. CONTROL OF SUPPLIER GENERATED DOCUMENTS*** *Supplier generated documents shall be controlled, handled, and approved in accordance with established methods. Means shall be implemented to assure that the submittal of these documents is accomplished in accordance with the procurement document requirements. These measures shall provide for the acquisition, processing, and recorded evaluation of technical, inspection, and test data against acceptance criteria.*	**N286.1-00** **4.7 Contract Administration** 4.7.2 Contractor documentation submitted for approval shall be reviewed and accepted by qualified personnel. 4.7.3 Provision shall be made for receipt, recording, collection, storage, maintenance, retention, and distribution of procurement records and documents submitted by contractors. 4.7.4 Changes affecting contractual, technical, and/or quality requirements made by either the contractor or the owner or participant shall be identified in writing and accepted by both the owner or participant and the contractor.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	7. CONTROL OF CHANGES IN ITEMS OR SERVICES *The Purchaser and Supplier shall assure that measures to control changes in procurement documents are established, implemented, and documented and are in accordance with this Part (Part I).*	**N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled. **4.7 Contract Administration** 4.7.4 Changes affecting contractual, technical, and/or quality requirements made by either the contractor or the owner or participant shall be identified in writing and accepted by both the owner or participant and the contractor. 4.7.5 Approved changes shall be incorporated into all affected contractual documents.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	8. ACCEPTANCE OF ITEM OR SERVICE ***8.1 General*** *Methods shall be established for the acceptance of an item or service being furnished by the Supplier. Prior to offering the item or service for acceptance, the Supplier shall verify that the item or service being furnished complies with the procurement requirements. Where required by code, regulation, or contract requirement, documentary evidence that items conform to procurement documents shall be available at the nuclear facility site prior to installation or use.*	**N286.1-00** **4.8 Verification of Purchased Items and Services** 4.8.1 Measures shall be established for the verification of the quality of purchased items or services. 4.8.2 Verification shall be planned, documented, and carried out by the owner or participant to ensure that items and/or services meet the requirements of the contract. 4.8.3 The extent of verification shall be directly proportional to the safety-related function of the item or service, the complexity of manufacturing the item or providing the service, and (if available) the contractor's performance history. In addition, applicable jurisdictional and regulatory verification requirements shall be identified and satisfied. 4.8.4 Verification may be performed at the contractor's facilities or upon receipt of the item(s), as determined by the verification plan.	The requirement that the supplier verify that the item or service being furnished complies with the procurement requirements is not addressed in the CSA N286 series of standards. However, Canadian manufacturing QA standards such as CSA Z299.1-85 impose such a requirement on the supplier. Clause 3.5.9, Final Inspection states: a) Inspect and identify the final product or service as required by the Inspection and Test Plan(s). b) Hold products and services pending review of inspection records and verify that the product or service has been inspected at all points shown in the inspection and test plan(s) and that these records are complete. c) Identify and hold non-conforming products or services. d) Make inspection and test records available to the customer representative before submitting products or services for acceptance. e) Submit to the customer representative for acceptance only those products or services which meet specified requirements. With respect to other product/service acceptance requirements CSA N286.1-00 and ASME NQA-1 have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	8.2 Methods of Acceptance *Purchaser methods used to accept an item or related service from a Supplier shall be Supplier Certificate of Conformance, source verification, receiving inspection, or post-installation test at the nuclear facility site, or a combination thereof.*	**N286.1-00** **4.8 Verification of Purchased Items and Services** 4.8.2 Verification shall be planned, documented, and carried out by the owner or participant to ensure that items and/or services meet the requirements of the contract. 4.8.3 The extent of verification shall be directly proportional to the safety-related function of the item or service, the complexity of manufacturing the item or providing the service, and (if available) the contractor's performance history. In addition, applicable jurisdictional and regulatory verification requirements shall be identified and satisfied. 4.8.4 Verification may be performed at the contractor's facilities or upon receipt of the item(s), as determined by the verification plan. **N286.4-86** **5. Verification Function** 5.1 Verification methods shall be implemented for determining that items are of the prescribed quality and that activities are accomplished as specified. 5.2 The scope of the verification function shall include the following: a) confirmation that the procedures are appropriate for the equipment or system being commissioned, operated, or maintained; b) confirmation that the performer is qualified and understands the required procedures; c) confirmation that performance activities are implemented in accordance with requirements; d) confirmation that all relevant parameters meet specified acceptance criteria; and e) confirmation that nonconformances were suitab identified and resolved.	The CSA N286 series of standards does not permit the use of Supplier Certificates of Conformance as a method of acceptance. Otherwise, both standards have similar requirements.	No Significant Difference; Certificate of Conformance from a supplier is one way of acceptance by the purchaser. NQA-1 allows other methods such as source inspection, or receiving inspection.

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	8.2.1 Certificate of Conformance. *When a Certificate of Conformance is used, the minimum criteria of (a) through (f) below shall be met.* *a) The certificate shall identify the purchased material or equipment, such as by the purchase order number.* *b) The certificate shall identify the specific procurement requirements met by the purchased material or equipment, such as codes, standards, and other specifications. This may be accomplished by including a list of the specific requirements or by providing, on-site, a copy of the purchase order and the procurement specifications or drawings, together with a suitable certificate. The procurement requirements identified shall include any approved changes, waivers, or deviations applicable to the subject material or equipment.* *c) The certificate shall identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformances.* *d) The certificate shall be signed or otherwise authenticated by a person who is responsible for this quality assurance function and whose function and position are described in the Purchaser's or Supplier's quality assurance program.* *e) The certification system, including the procedures to be followed in filling out a certificate and the administrative procedures for review and approval of the certificates, shall be described in the Purchaser's or Supplier's quality assurance program.* *f) Means shall be provided to verify the validity of Supplier certificates and the effectiveness of the certification system, such as during the performance of audits of the Supplier or independent inspection or test of the items. Such verification shall be conducted by the Purchaser at intervals commensurate with the Supplier's past quality performance.*		The CSA N286 series of standards does not permit the use of Supplier Certificates of Conformance as a method of acceptance.	See above

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	8.2.2 ***Source Verification.*** *When source verification is used, it shall be performed at intervals consistent with the importance and complexity of the item or service, and it shall be implemented to monitor, witness, or observe activities. Source verification shall be implemented in accordance with plans to perform inspections, examinations, or tests at predetermined points. Upon Purchaser acceptance of source verification, documented evidence of acceptance shall be furnished to the receiving destination of the item, to the Purchaser, and to the Supplier.*	**N286.1-00** **4.8 Verification of Purchased Items and Services.** 4.8.4 Verification may be performed at the contractor's facilities or upon receipt of the item(s), as determined by the verification plan. **Z299.1-85** **3.2.5 Independent Inspection, Witnessing, and Monitoring** Assign personnel to perform the inspection, witnessing, or monitoring of characteristics for acceptance who shall be other than those performing or directly supervising the work being accepted. Such personnel shall not report directly to immediate supervisors responsible for producing the work being accepted unless it is specifically permitted otherwise in the Inspection and Test Plan and agreed in writing by the customer before the contract is let. However, additional in-process inspections, as allowed by Clause 3.5.6.2(c), may be carried out by anyone. **3.5.8 In-Process Inspection** a) Inspect and identify products or services as required by the Inspection and Test Plan(s). b) Monitor special process methods. c) Hold products or services until the required inspections and tests are completed or necessary inspection and test reports are received and verified, except when products or services are released under positive recall. Release under positive recall shall not preclude Item (a) above. d) Identify and hold nonconforming products or services.	Canadian standards in the N286 and the Z299 series and ASME NQA-1-1994 have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**Z299.1-85** **3.5.6 Inspection and Test Plan(s)** 3.5.6.1 a) Plan the inspection and test activities for the constituent phases of the work such as procurement and production. b) Document an Inspection and Test Plan(s) which describes the inspections, tests, and verifications for the product or service specified in the contract. Regardless of who prepares the Plan(s), it shall be approved by the organization primarily responsible for quality assurance. c) The Plan(s) may be of any format to suit the supplier's system. The Plan(s) shall meet as a minimum but are not limited to requirements specified in Clause 3.5.6.2.	See above.	

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	8.2.3 Receiving Inspection. *When receiving inspection is used, purchased items shall be inspected as necessary to verify conformance to specified requirements, taking into account source verification and audit activities and the demonstrated quality performance of the Supplier. Receiving inspection shall be performed in accordance with established procedures and inspection instructions, to verify by objective evidence such features as proper configuration; identification; dimensional, physical, and other characteristics; freedom from shipping damage; and cleanness. Receiving inspection shall be coordinated with review of Supplier documentation when procurement documents require such documentation to be furnished prior to receiving inspection.*	**N286.1-00** **4.8 Verification of Purchased Items and Services** 4.8.4 Verification may be performed at the contractor's facilities or upon receipt of the item(s), as determined by the verification plan. **N286.3-99** **3.9.3.2 Receiving** 3.9.3.2.1 Visual examination shall be performed and documented to establish that a) the item received is free from physical damage; b) the specified packaging and shipping requirements have been maintained during shipping; c) identification and markings are in accordance with applicable codes, specifications, purchase orders and drawings; and d) protective covers and seals, coating and preservatives, inert gas blankets, and desiccants, etc, are performing as intended. 3.9.3.2.2 In addition, it shall be established that evidence is available that a) the item received was fabricated, tested, and inspected prior to shipment in accordance with, and meets, the applicable code, specification, purchase order, and/or drawings; b) the documentation requirements of the purchase order for the item have been met; and c) the documentation has been reviewed by an organization other than the issuer of the documentation to ensure that the technical requirements of the item have been met.	Both standards have similar requirements	No Significant Difference; No Impact on the ACR QA Program.

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	8.2.4 Post-Installation Testing. *When post-installation testing is used, post-installation test requirements and acceptance documentation shall be mutually established by the Purchaser and Supplier.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records. **N286.3-99** **3.10.3 Inspection and Test** 3.10.3.1 Inspections and tests shall be carried out in accordance with approved procedures that will provide for: a) identification of the reference documents that specify the inspection or test requirements; b) identification of characteristics to be inspected or tested; c) acceptance criteria; d) a description of the method of inspection or test, including the equipment to be used and the conditions that must be controlled; and e) identification of the individuals or groups responsible for performing the activities.	Both standards have similar requirements	No Significant Difference; No Impact on the ACR QA Program.

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	8.3 Acceptance of Services Only *In certain cases involving procurement of services only, such as third party inspection; engineering and consulting services; and installation, repair, overhaul, or maintenance work, the Purchaser shall accept the service by any or all of the following methods:* *a) technical verification of data produced;* *b) surveillance and/or audit of the activity;* *c) review of objective evidence for conformance to the procurement document requirements such as certifications, stress reports, etc.*	**N286.1-00** **Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	The CSA N286 series of standards does not provide unique requirements for the acceptance of services. As appropriate, the same acceptance requirements are considered applicable for services as for items, products, and components.	No Significant Difference; No Impact on the ACR QA Program.

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	9. CONTROL OF SUPPLIER NONCONFORMANCES *The Purchaser and Supplier shall establish and document methods for disposition of items and services that do not meet procurement documentation requirements.* *These methods shall contain provision for (a) through (e) below:* *a) evaluation of nonconforming items;* *b) submittal of nonconformance notice to Purchaser by Supplier as directed by the Purchaser. These submittals shall include Supplier-recommended disposition (e.g., use-as-is or repair) and technical justification. Nonconformances to the procurement requirements or Purchaser-approved documents, which consist of one or more of the following, shall be submitted to the Purchaser for approval of the recommended disposition:* *1) technical or material requirement is violated;* *2) requirement in Supplier documents, which has been approved by the Purchaser, is violated;* *3) nonconformance cannot be corrected by continuation of the original manufacturing process or by rework;* *4) the item does not conform to the original requirement even though the item can be restored to a condition such that the capability of the item to function is unimpaired;* *c) Purchaser disposition of Supplier recommendation;* *d) verification of the implementation of the disposition;* *e) maintenance of records of Supplier-submitted nonconformances.*	**N286.0-92** **13. Nonconformance** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	The basic requirements to control suppliers' nion-conformances are addressed in the CSA N286 series of standards. More specific requirements are given in manufacturing standards such as Z299.1-85. For example, its clause 3.5.17.1 states: The supplier is responsible for the disposition of all nonconformances including those of Sub-suppliers. Final acceptance of the supplier's disposition of nonconformances which violate contractual requirements is the prerogative of the customer. a) Identify and hold nonconformances for evaluation. b) **Identify and define the responsibilities and authority of those assigned to the** c) disposition of nonconforming products and services. d) Provide for a program or technical review that involves representatives from all e) pertinent functions, including the quality assurance function. f) Record each nonconformance. g) Develop a disposition with responsible parties. Repair and use-as-is dispositions h) require concurrence of all responsible parties, and submission for acceptance to the i) customer as required. j) Implement the accepted disposition.	No Significant Difference; No Impact on the ACR QA Program.

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	10. COMMERCIAL GRADE ITEMS *Where the design utilizes commercial grade items, the following requirements are an acceptable alternate to other requirements of this Supplement, except as noted in (b) below and the requirements of Supplement 4S-1.* *a) The commercial grade item is identified in an approved design output document. An alternate commercial grade item may be applied, provided the cognizant design organization provides verification that the alternate commercial grade item will perform the intended function and will meet design requirements applicable to both the replaced item and its application.* *b) Source evaluation and selection, where determined necessary by the Purchaser based on complexity and importance to safety, shall be in accordance with para. 3.1 of this Supplement.* *c) Commercial grade items shall be identified in the purchase order by the manufacturer's published product description (for example, catalogue number).* *d) After receipt of a commercial grade item, the Purchaser shall determine that:* *1) damage was not sustained during shipment;* *2) the item received was the item ordered;* *3) inspection and/or testing is accomplished, as required by the Purchaser, to assure conformance with the manufacturer's published requirements;* *4) documentation, as applicable to the item, was received and is acceptable.*	**N286.1-00** **4.3 Preparation for Request to Bid** Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records.	The CSA N286 series of standards provides general requirements for specifying all items, but does not provide specific requirements for dealing with commercial grade items.	Significant Difference; ACR to review its method of acceptance of commercial grade items, when it utilizes a commercial grade item. The ACR QA program will ensure that the requirements of Clause 10 of 7S1 are met.

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VIII. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS Measures shall be established for the identification and control of materials, parts, and components, including partially fabricated assemblies. These measures shall assure that identification of the item is maintained by heat number, part number, serial number, or other appropriate means, either on the item or on records traceable to the item, as required throughout fabrication, erection, Installation, and use of the item. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, and components.	**BASIC REQUIREMENT 8: IDENTIFICATION AND CONTROL OF ITEMS** Controls shall be established to assure that only correct and accepted items are used or installed. Identification shall be maintained on the items or in documents traceable to the items, or in a manner which assures that identification is established and maintained.	**N286.0-92** **11. Control of Items, Processes, and Practices** 11.1 The owner shall ensure that second-tier measures are established so that a) only specified and accepted items, processes, and practices are used; and b) items, processes, and practices meet the requirements of applicable Standards. **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrie and traceable to the items and activities to whic refer.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 8S-1 ***Supplementary Requirements for Identification and Control of Items*** ***1. GENERAL*** *This Supplement provides amplified requirements for identification and control of items. It supplements the requirements of Basic Requirement 8 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2.1 IDENTIFICATION METHODS ***2.1 Item Identification*** *Items of production (batch, lot, component, part) shall be identified from the initial receipt and fabrication of the items up to and including installation and use. This identification shall relate an item to an applicable design or other pertinent specifying document.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.3-99** **3.9.4 Identification and Traceability** 3.9.3.2 Physical identification shall be used to the maximum extent possible. Where physical identification is impracticable or insufficient, physical separation, procedural control, or other appropriate means shall be employed. Identification may be either on the item or on records traceable to the item.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	2.2 Physical Identification *Physical identification shall be used to the maximum extent possible. Where physical identification on the item is either impractical or insufficient, physical separation, procedural control, or other appropriate means shall be employed.*	**N286.3-99** **3.9.4 Identification and Traceability** 3.9.4.2 Physical identification shall be used to the maximum extent possible. Where physical identification is impracticable or insufficient, physical separation, procedural control, or other appropriate means shall be employed. Identification may be either on the item or on records traceable to the item.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	2.3 Markings *Identification markings, when used, shall be applied using materials and methods which provide a clear and legible identification and do not detrimentally affect the function or service life of the item. Markings shall be transferred to each part of an identified item when subdivided and shall not be obliterated or hidden by surface treatment or coatings unless other means of identification are substituted.*	**N286.3-99** **3.9.4 Identification and Traceability** 3.9.4.3 Where identification marking is employed, the marking shall be clear and permanent and shall not be detrimental to the item or affect the function of the item. 3.9.4.4 Marking shall be transferred to each part of an item when subdivided, and shall not be obliterated or hidden by surface treatment or coating unless other means of identification are substituted.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3. SPECIFIC REQUIREMENTS ***3.1 Identification and Traceability of Items*** *When specified by codes, standards, or specifications that include specific identification or traceability requirements (such as identification or traceability of the item to applicable specification and grade of material; heat, batch, lot, part, or serial number; or specified inspection, test, or other records), the program shall be designed to provide such identification and traceability control.*	**N286.3-99** **3.9.4 Identification and Traceability** 3.9.4.5 When codes, standards, or specifications include specific identification or traceability requirements, such as identification or traceability of the item to applicable specification and grade of material, heat, batch, lot, part, or serial number, or to specified inspection, test, or other records, the program shall be designed to provide such identification and traceability control.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	3.2 Limited Life Items *Where specified, items having limited calendar or operating life or cycles shall be identified and controlled to preclude use of items whose shelf life or operating life has expired.*	**N286.3-99** **3.9.3.3 Storage and Handling** 3.9.3.3.1 Measures for the control of storage and handling shall be such as to preserve items from the time of their receipt and prevent their abuse, misuse, damage, deterioration, or loss. 3.9.3.3.2 Inspections shall be performed periodically and the results documented to ensure that storage areas and the integrity of the items are being maintained as required. **N286.5-95** **5.9.6 Handling and Storage** 5.9.6.1 Handling and storage of replacement items shall be controlled to prevent their a) abuse; b) misuse; c) damage; d) deterioration; or e) loss. 5.9.6.2 Materials and equipment shall be a) subject to an inspection and maintenance program; b) stored in an appropriate environment.	The CSA N286 series of standards has more generic requirements regarding handling and storage than ASME NQA-1-1994. However, the CSA N286 series of standards envelops the ASME NQA-1-1994 requirements regarding limited life items.	No Significant Difference; No Impact on the ACR QA Program.

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	3.3 Maintaining Identification of Stored Items *Provisions shall be made for the control of item identification consistent with the planned duration and conditions of storage, such as:* *a) provisions for maintenance or replacement of markings and identification records due to damage during handling or aging;* *b) protection of identifications on items subject to excessive deterioration due to environmental exposure;* *c) provisions for updating existing plant records.*	**N286.5-95** **5.9.6 Handling and Storage** 5.9.6.1 Handling and storage of replacement items shall be controlled to prevent their a) abuse; b) misuse; c) damage; d) deterioration; or e) loss. 5.9.6.2 Materials and equipment shall be a) subject to an inspection and maintenance program; b) stored in an appropriate environment.	The CSA N286 series of standards does not have explicit requirements for the preservation of markings.	Not applicable for ACR Design Certification
IX. CONTROL OF SPECIAL PROCESSES Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.	**BASIC REQUIREMENT 9: CONTROL OF PROCESSES** Processes affecting quality of items or services shall be controlled. Special processes that control or verify quality, such as those used in welding, heat treating, and nondestructive examination, shall be performed by qualified personnel using qualified procedures in accordance with specified requirements.	**N286.0-92** **11. Control of Items, Processes, and Practices** 11.1 The owner shall ensure that second-tier measures are established so that a) only specified and accepted items, processes, and practices are used; and b) items, processes, and practices meet the requirements of applicable Standards. **N286.3-99** **3.9.5 Control of Special Processes** 3.9.5.1 Special processes are those functions the results of which cannot be examined directly, or in which evidence generated during the process must be used to verify conformance. Typically, the validity of the results is dependent on the use of correct techniques and interpretation of results. Special processes include welding, heat-treating, cleaning, protective coating, concrete work, nondestructive examination, and leak testing. 3.9.5.3 Personnel, procedures, and equipment shall be qualified in accordance with the applicable codes and standards. These qualifications shall be documented.	Both standards have similar requirements. Note that the language of ASME NQA-1-1994 suggests including all processes, and not just special processes as indicated in 10CFR50 Appendix B. ASME NQA-1-2000 is amended to apply only to special processes. Note also that the Standard Review Plan, NUREG-0800, Rev. 2 – July 1981 talks only about special processes.	No Significant Difference; No Impact on the ACR QA Program.

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	SUPPLEMENT 9S-1 ***Supplementary Requirements for Control of Processes*** ***1. GENERAL*** *This Supplement provides amplified requirements for control of processes. It supplements the requirements of Basic Requirement 9 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below
	2. PROCESS CONTROL *Processes shall be controlled by instructions, procedures, drawings, checklists, travelers, or other appropriate means. These means shall assure that process parameters are controlled and that specified environmental conditions are maintained.*	**N286.3-99** **3.8.3 Installation Procedures and Work Instructions** 3.8.3.1 Construction activities shall be carried out in accordance with drawings and specifications and, where required, with installation procedures and work instructions.	Note that the language of ASME NQA-1-1994 suggests including all processes, and not just special processes as indicated in 10CFR50 Appendix B. ASME NQA-1-2000 is amended to apply only to special processes. Note also that the Standard Review Plan, NUREG-0800, Rev. 2 – July 1981 talks only about special processes. Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	3. SPECIAL PROCESSES *Each special process shall be performed in accordance with appropriate instructions which include or reference procedure, personnel, and equipment qualification requirements.*	**N286.3-99** **3.9.5 Control of Special Processes** 3.9.5.2 Measures shall be established and documented to assure that special processes are accomplished under controlled conditions.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3.1 Responsibility *It is the responsibility of the organization performing the special process to adhere to the approved procedures and processes.* ***3.1.1*** *Qualification of personnel, procedures, and equipment shall comply with specified requirements.* ***3.1.2*** *Conditions necessary for accomplishment of the process shall be included in procedures or instructions. These conditions shall include proper equipment, controlled parameters of the process, and calibration requirements.*	**N286.3-99** **3.8.3 Installation Procedures and Work Instructions** 3.8.3.1 Construction activities shall be carried out in accordance with drawings and specifications and, where required, with installation procedures and work instructions. **3.9.5 Control of Special Processes** 3.9.5.1 Measures shall be established and documented to assure that special processes are accomplished under controlled conditions. 3.9.5.3 Personnel, procedures, and equipment shall be qualified in accordance with the applicable codes and standards. These qualifications shall be documented.	Both standards have similar requirements. However, the N286 series of standards does not specify the requirement explicitly that special process procedures include the conditions necessary for accomplishing the process including proper equipment, controlled parameters of the process, and calibration requirements.	No Significant Difference; No Impact on the ACR QA Program.
	3.2 Acceptance Criteria *The requirements of applicable codes and standards, including acceptance criteria for the process, shall be specified or referenced in the procedures or instructions.*	**N286.3-99** **3.9.5 Control of Special Processes** 3.9.5.2 Personnel, procedures, and equipment shall be qualified in accordance with the applicable codes and standards. These qualifications shall be documented.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	3.3 Records *Records shall be maintained as appropriate for the currently qualified personnel, processes, and equipment of each special process.*	**N286.3-99** **3.9.5 Control of Special Processes** 3.9.5.3 Personnel, procedures, and equipment shall be qualified in accordance with the applicable codes and standards. These qualifications shall be documented.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	3.4 Special Requirements *For special processes not covered by existing codes and standards or where quality requirements specified for an item exceed those of existing codes or standards, the necessary requirements for qualifications of personnel, procedures, or equipment shall be specified or referenced in the procedures or instructions.*	**N286.3-99** **3.9.5 Control of Special Processes** 3.9.5.4 Processes may be identified as special processes when they have not been covered by existing codes or standards or when item quality requirements exceed the requirements of established codes or standards. The qualification of personnel, procedures, or equipment, as necessary, shall not defined, implemented, and documented.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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X. INSPECTION A program for inspection of activities affecting quality shall be 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. Such inspection shall be performed by individuals other than those who performed the activity being inspected.	**BASIC REQUIREMENT 10: INSPECTION** 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 for acceptance shall be performed by persons other than those who performed or directly supervised the work being inspected.	**N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **4.8 Verification of Purchased Items and Services.** 4.8.2 Verification shall be planned, documented, and carried out by the owner or participant to ensure that items and/or services meet the requirements of the contract. **N286.3-99** **3.10 Verification** 3.10.1.1 Verification activities shall be identified, planned, and documented to ensure the conformance of construction activities and items to documented instructions, procedures, standards, codes, specifications, and drawings. These plans shall include a comprehensive program of reviews, checks, inspections, and tests. 3.10.1.4 Verification shall be carried out by appropriately qualified individuals other than those who executed the work or activity.	The N286 series of standards does not have specific requirements for inspections. It considers inspections a form of verification. On this basis both standards have similar requirements. CSA Z299.1 clauses 3.5.7 to 3.5.10 provide detailed QA requirements for inspection activities during manufacturing.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.4-86** **5. Verification Function** 5.1 Verification methods shall be implemented for determining that items are of the prescribed quality and that activities are accomplished as specified. 5.5. Required verification activities shall be planned and sequenced with commissioning activities. Separate verification and commissioning procedures are not necessarily required. Deviations from planned verification activities shall be approved. 5.7 Persons with the responsibility to execute verification activities shall be identified in verification procedures or other related documents. These persons shall (a) not verify activities that they have performed or decisions that they have made themselves; and (b) report observed nonconformances to the appropriate level of management. Where verification activities are carried out by the performer's immediate supervisor, such a person shall meet the above criteria. **N286.5-95** **3.10 Verification** 3.10.1 Work requiring specific independent in-field inspection, to confirm that results meet requirements, shall be ~ The extent of inspection may vary depending up on-the complexity of the work and the potential impact on safety.	See above.	

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	See above.	**N286.5-95** **3.10 Verification** 3.10.2 Required inspection activities shall be planned before starting the work, including identification of a) what is to be inspected; b) when the inspection is to be performed; c) who is to conduct the inspection; and d) method and acceptance criteria. The method, extent and timing of the inspection shall be based on its ability to detect a non-conformance. 3.10.4 Persons assigned to perform inspection shall a) be objective; b) not inspect their own work; and c) report all non-conformances. 3.10.5 The identity of the inspectors shall be recorded.	See above.	
	SUPPLEMENT 10S-1 ***Supplementary Requirements for Inspection*** ***1. GENERAL*** *This Supplement provides amplified requirements for inspection of items and activities. It supplements the requirements of Basic Requirement 10 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. INSPECTION REQUIREMENTS *Inspection requirements and acceptance criteria shall include specified requirements contained in the applicable design documents or other pertinent technical documents approved by the responsible design organization. Inspection activities shall be documented and controlled by instructions, procedures, drawings, checklists, travelers, or other appropriate means.*	**N286.2-00** **5.10 Design Records** 5.10.1 Design records shall include design documents that a) specify design requirement and sources of design input; b) contain technical information for fabrication, construction, installation, commissioning, operation, or decommissioning; c) substantiate the technical adequacy of the design; and d) are required for licensing purposes or to meet applicable codes and standards. **N286.3-99** **3.10.3 Inspection and Test** 3.10.3.1 Inspections and tests shall be carried out in accordance with approved procedures that will provide for: a) identification of the reference documents that specify the inspection or test requirements; b) identification of characteristics to be inspected or tested; c) acceptance criteria; d) a description of the method of inspection or test, including the equipment to be used and the conditions that must be controlled; and e) identification of the individuals or groups responsible for performing the activities.	Both standards have similar requirements. CSA Z299.1 clauses 3.5.7 to 3.5.10 provide detailed QA requirements for inspection activities during manufacturing.	No Significant Difference; No Impact on the ACR QA Program.

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	3. PERSONNEL ***3.1 Reporting Independence*** *Inspection personnel shall not report directly to the immediate supervisors who are responsible for performing the work being inspected.*	**N286.0-92** **12. Verification** 12.1 The owner shall ensure that second-tier measures are established so that: a) required verification activities are identified, planned, executed, and documented; b) the method, extent, and timing of the verification and the identity of the verifiers are recorded; and c) verification of work is appropriately independent from performance of the work. **N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **N286.3-99** **3.10 Verification** 3.10.1.4 Verification shall be carried out by appropriately qualified individuals other than those who executed the work or activity. **N286.5-95** **3.10 Verification** 4.10.4 Persons assigned to perform inspection shall a) be objective; b) not inspect their own work; and c) report all non-conformances.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3.2 Qualification *Each person who verifies conformance of work activities for purposes of acceptance shall be qualified to perform the assigned inspection task.* *Inspections by persons during on-the-job training for qualification shall be performed under the direct observation and supervision of a qualified person and verification of conformance shall be by the qualified person until certification is achieved.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them. **N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **N286.3-99** **3.10 Verification** 3.10.1.4 Verification shall be carried out by appropriately qualified individuals other than those who executed the work or activity. **N286.5-95** **3.4 Personnel Capability** 3.4.1 Personnel responsible for operations activities shall be competent to perform the tasks assigned to them.	Both standards have similar requirements with respect to the requirement that only qualified staff perform inspections. The CSA N286 series of standards does not provide explicit requirements for controlling the activities of inspector-trainees during on-the-job training.	No Significant Difference; No Impact on the ACR QA Program.

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X. INSPECTION Cont'd 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 shall be indicated in appropriate documents.	***4. INSPECTION HOLD POINTS*** *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 shall be indicated in appropriate documents. Consent to waive specified hold points shall be recorded prior to continuation of work beyond the designated hold point.*	**N286.1-00** **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records. **4.7 Contract Administration** 4.7.4 Changes affecting contractual, technical, and/or quality requirements made by either the contractor or the owner or participant shall be identified in writing and accepted by both the owner or participant and the contractor. **4.8 Verification of Purchased Items and Services** 4.8.5 The contractor's performance shall be monitored, and if necessary, verification activities shall be modified.	The N286 series of standards refers only to inspection requirements, which would include hold points. Specific reference to hold points is made in manufacturing QA standards such as CSA Z299.1-85. It states in clause 3.5.6.2: "Identify in the Inspection and Test Plan(s) (a) what products or services are to be subcontracted and specify the quality assurance programs to be applied; (b) how the supplier will verify the subsupplier's conformance to specified requirements by one or more of the following methods: (i) inspection and test by the subsupplier as defined in the subsupplier's Inspection and Test Plan(s); (ii) inspection and test by the supplier at the subsupplier's facility; (iii) surveillance by the supplier; (vi) incoming inspection; (c) where each inspection and test point is located in the production cycle, including incoming inspection, preservation of products, packaging, and site inspection and testing; if the supplier intends to perform additional in-process inspections and tests for his own evaluation of quality, they shall be indicated; the fact that they are not subject to customer representative acceptance shall also be indicated: (d) what characteristics are to be inspected and tested at each point and specify or reference inspection and test procedures, sampling plans, and acceptance criteria to be used; Continued below.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	See above	(e) inspection and test points where a history of usage of measuring and test equipment shall be maintained so that assessments required by Clause 3.5.4(m) can be met; (f) where the customer has established witness or verification points for selected characteristics of a product or service and beyond which the work shall not proceed; (g) where and how product acceptance to special production process procedures will be accomplished and documented as specified in Clause 3.5.14; (h) where statistical process control techniques will be used for product acceptance; (i) where lots or batches will be used; and (j) what will be included in the review required by Clause 3.5.9(b)".	

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	5. INSPECTION PLANNING ***5.1 Planning*** *Planning for inspection activities shall be accomplished and documented. The documentation shall identify characteristics, methods, and acceptance criteria, and shall provide for recording objective evidence of inspection results.*	**N286.1-00** **3.10 Verification** 3.10.2 Verification activities shall be planned, carried out, and documented by qualified personnel other than those who performed the work or activity. **Z299.1-85** **3.5.6 Inspection and Test Plans** 3.5.6.2 Identify in the Inspection and Test Plan(s) (a) what products or services are to be subcontracted and specify the quality assurance programs to be applied; (b) how the supplier will verify the subsupplier's conformance to specified requirements by one or more of the following methods: (i) inspection and test by the subsupplier as defined in the subsupplier's Inspection and Test Plan(s); (ii) inspection and test by the supplier at the subsupplier's facility; (iii) surveillance by the supplier; (iv) incoming inspection; (c) where each inspection and test point is located in the production cycle, including incoming inspection, preservation of products, packaging, and site inspection and testing; if the supplier intends to perform additional in-process inspections and tests for his own evaluation of quality, they shall be indicated; the fact that they are not subject to customer representative acceptance shall also be indicated: (d) what characteristics are to be inspected and tested at each point and specify or reference inspection and test procedures, sampling plans, and acceptance criteria to be used; Continued below	Taking into consideration requirements of manufacturing QA standards such as CSA Z299.1-85, both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	See above.	(e) inspection and test points where a history of usage of measuring and test equipment shall be maintained so that assessments required by Clause 3.5.4(m) can be met; (f) where the customer has established witness or verification points for selected characteristics of a product or service and beyond which the work shall not proceed; (g) where and how product acceptance to special production process procedures will be accomplished and documented as specified in Clause 3.5.14; (h) where statistical process control techniques will be used for product acceptance; (i) where lots or batches will be used; and (j) what will be included in the review required by Clause 3.5.9(b). **N286.3-99** **3.10 Verification** **3.10.1 General** 3.10.1.1 Verification activities shall be identified, planned, and documented to ensure the conformance of construction activities and items to documented instructions, procedures, standards, codes, specifications, and drawings. These plans shall include a comprehensive program of reviews, checks, inspections, and tests. **N286.5-95** **3.10 Verification** 3.10.2 Required inspection activities shall be planned before starting the work, including identification of a) what is to be inspected; b) when the inspection is to be performed; c) who is to conduct the inspection; and d) method and acceptance criteria. The method, extent and timing of the inspection shall be based on its ability to detect a non-conformance.	See above.	

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	5.2 Sampling *Where a sample is used to verify acceptability of a group of items, the sampling procedure shall be based on recognized standard practices.*	**N286.3-99** **3.10.2 Verification Planning** 3.10.2.4 When sampling will be used to verify acceptability of a group of items, the sampling procedure shall be based on recognized standard practices and shall provide adequate justification for the sample size and selection process. **Z299.1-85** See Clause 3.5.6.2 (d) and (h) above. **3.5.20 Statistical Techniques** (a) Identify and classify product, process, and service characteristics for which statistical techniques will be used as a basis for the assurance and control of quality and acceptance or rejection of lots. (b) Select appropriate statistical techniques and confidence levels for process control and product acceptance and indicate the basis for selection. (c) Apply the statistical techniques selected, review them for adequacy, and monitor their application to ensure that specified requirements are met. (d) Include or reference the selected statistical techniques used for product or service acceptance or special process monitoring specified in the Inspection and Test Plan(s) (Clause 3.5.6.2(h)).	Canadian manufacturing standards in the CSA Z299 series have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
X. INSPECTION Cont'd Examinations, measurements, or tests of material or products processed shall be performed for each work operation where necessary to assure quality. If inspection of processed material or products is impossible or disadvantageous, indirect control by monitoring processing methods, equipment, and personnel shall be provided. Both inspection and process monitoring shall be provided when control is inadequate without both.	***6. IN-PROCESS INSPECTION*** ***6.1 Inspection*** *Inspection of items in-process or under construction shall be performed for work activities where necessary to verify quality. If inspection of processed items is impossible or disadvantageous, indirect control by monitoring of processing methods, equipment, and personnel shall be provided.* *Both inspection and process monitoring shall be provided when control is inadequate without both.*	**N286.3-99** **3.10.3 Inspection and Test** 3.10.3.1 Inspections and tests shall be carried out in accordance with approved procedures that will provide for: a) identification of the reference documents that specify the inspection or test requirements; b) identification of characteristics to be inspected or tested; c) acceptance criteria; d) a description of the method of inspection or test, including the equipment to be used and the conditions that must be controlled; and e) identification of the individuals or groups responsible for performing the activities. **Z299.1-85** **3.5.8 In-Process Inspection** (a) Inspect and identify products or services as required by the Inspection and Test Plan(s). (b) Monitor special process methods. (c) Hold products or services until the required inspections and tests are completed or necessary inspection and test reports are received and verified, except when products or services are released under positive recall. Release under positive recall shall not preclude Item (a) above. (d) Identify and hold nonconforming products or services.	The CSA N286 and Z299 series of standards do not have specific requirements regarding items that are impossible or disadvantageous to inspect. These standards also do not specify a requirement to perform both inspections and process monitoring when necessary. Unique NQA-1 requirements are: • Indirect control by monitoring of processing methods, equipment, and personnel are provided, if inspection of processed items is impossible or disadvantageous. • Both inspection and process monitoring are provided when control is inadequate without both.	No Significant Difference; No Impact on the ACR QA Program.

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	6.2 Combined Inspection and Monitoring ***6.2.1*** *A combination of inspection and process monitoring methods, when used, shall be performed in a systematic manner to assure that the specified requirements for control of the process and quality of the item are being achieved throughout the duration of the process.* ***6.2.2*** *Controls, where required, shall be established and documented for the coordination and sequencing of these activities at established inspection points during successive stages of the conducted process or construction.*		The CSA N286 and Z299 series of standards do not have specific requirements to perform both inspections and process monitoring when necessary.	No Significant Difference; No Impact on the ACR QA Program.

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	7. FINAL INSPECTIONS ***7.1 Resolution of Nonconformances*** *Final inspections shall include a records review of the results and resolution of nonconformances identified by prior inspections. The final inspection shall be planned to arrive at a conclusion regarding conformance of the item to specified requirements.*	**Z299.1-85** **3.5.9 Final Inspection** (a) Inspect and identify the final product or service as required by the Inspection and Test Plan(s). (b) Hold products and services pending review of inspection records and verify that the product or service has been inspected at all points shown in the Inspection and Test Plan(s) and that these records are complete. (c) Identify and hold nonconforming products or services. (d) Make inspection and test records available to the customer representative before submitting products or services for acceptance. (e) Submit to the customer representative for acceptance only those products or services which meet specified requirements. **N286.4-86** **5. Verification Function** 5.9 Procedures shall be implemented to ensure that the following verification activities are planned and implemented as appropriate: (a) Procedure Verification. Commissioning documentation shall be reviewed prior to use to ensure that it is appropriate and complies with the design requirements and the design intent. Where appropriate, this shall include review and acceptance by persons with design responsibility. (b) Confirmatory Inspection. Visual or physical confirmation that prerequisites have been met, or that activities have been performed satisfactorily, shall be carried out according to identified requirements. (c) Witnessing. When the performance of a commissioning activity is to be directly observed, it shall be designated by hold or witness points and carried out according to identified requirements. Continued below	Canadian standards do not provide explicitly for a records review of results of previous inspections.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	(d) Surveillance. Periodic observation or monitoring of activities or items to confirm adherence to requirements shall be carried **out** according to identified requirements. (e) Inspection. The quality characteristics of identified items shall be examined or measured during or following maintenance, repair, or modification, to ensure that specified quality requirements have been met. (f) Functional Testing. Following maintenance, repair, or modification, the capability of items to meet specified functional requirements shall be determined by subjection to physical, chemical, environmental, or operating conditions. (g) Results Verification. Commissioning records, reports, or results shall be reviewed to confirm that the prescribed work has been performed and that the results are satisfactory. Appropriate commissioning results shall also be reviewed by persons with design responsibility before systems are declared available for service. Authorized signatures shall be used on reports and records to indicate final acceptance of items being commissioned.	See above.	
	See above.	**N286.5-95** **4.4.2.1 System Turnover to Operations** System turnover to operations shall be controlled. The following requirements shall be addressed: a) Prior to acceptance, operations staff shall visually inspect the field equipment that is being turned over. All deficiencies shall be recorded and a disposition made in accordance with Clause 3.11 b) System boundaries shall be clearly identified in the field and on transfer documents. Relevant operator aid documents such as flow sheets shall be marked to note system boundaries. c) The operations staff shall determine that the requirements of CSA Standard CAN/CSA-N286.4 have been satisfied for the affected system or equipment. This applies to new or modified equipment.	See above.	

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	7.2 Inspection Requirements *Completed items shall be inspected for completeness, markings, calibration, adjustments, protection from damage, or other characteristics as required to verify the quality and conformances of the item to specified requirements. Quality records shall be examined for adequacy and completeness if not previously so examined.*	**N286.3-99** **3.9.3.2 Receiving** 3.9.3.2.1 Visual examination shall be performed and documented to establish that a) the item received is free from physical damage; b) the specified packaging and shipping requirements have been maintained during shipping; c) identification and markings are in accordance with applicable codes, specifications, purchase orders and drawings; and d) protective covers and seals, coating and preservatives, inert gas blankets, and desiccants, etc, are performing as intended.	Both standards have similar inspection requirements except for the following requirement: • Examine quality records for adequacy and completeness if not previously so examined.	No Significant Difference; No Impact on the ACR QA Program.
	7.3 Acceptance *The acceptance of the item shall be documented and approved by authorized personnel.*		The CSA N286 series of standards does not specify a requirement to document and approve the acceptance of items.	No Significant Difference; No Impact on the ACR QA Program.

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	7.4 Modifications, Repairs, or Replacements *Modifications, repairs, or replacements of items performed subsequent to final inspection shall require re-inspection or retest, as appropriate, to verify acceptability.*	**N286.3-99** **3.11 Nonconformance** 3.11.7 Repaired and reworked items shall be re-inspected in accordance with applicable procedures. N286.4-86 5. Verification 5.9 Procedures shall be implemented to ensure that the following verification activities are planned and implemented as appropriate: (a) Procedure Verification. Commissioning documentation shall be reviewed prior to use to ensure that it is appropriate and complies with the design requirements and the design intent. Where appropriate, this shall include review and acceptance by persons with design responsibility. (b) Confirmatory Inspection. Visual or physical confirmation that prerequisites have been met, or that activities have been performed satisfactorily, shall be carried out according to identified requirements. (c) Witnessing. When the performance of a commissioning activity is to be directly observed, it shall be designated by hold or witness points and carried out according to identified requirements. Continued below	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	(d) Surveillance. Periodic observation or monitoring of activities or items to confirm adherence to requirements shall be carried **out** according to identified requirements. (e) Inspection. The quality characteristics of identified items shall be examined or measured during or following maintenance, repair, or modification, to ensure that specified quality requirements have been met. (f) Functional Testing. Following maintenance, repair, or modification, the capability of items to meet specified functional requirements shall be determined by subjection to physical, chemical, environmental, or operating conditions. (g) Results Verification. Commissioning records, reports, or results shall be reviewed to confirm that the prescribed work has been performed and that the results are satisfactory. Appropriate commissioning results shall also be reviewed by persons with design responsibility before systems are declared available for service. Authorized signatures shall be used on reports and records to indicate final acceptance of items being commissioned. **N286.5-95** **Control of Items and Processes** 3.9.1 Only specified and accepted items, processes, and practices shall be used. **3.13 Change Control** 3.13.1 Permanent and temporary changes to accepted designs, items, computer software, processes and practices shall be a) reviewed and approved before they are implemented; b) reviewed and approved by persons who have full knowledge of the original and current intent and requirements; and c) documented.	See above.	

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	8. INSERVICE INSPECTION ***8.1 Planning and Performance*** *Required inservice inspection or surveillance of structures, systems, or components shall be planned and executed by or for the organization responsible for operation.*	**N286.5-95** **3.8 Work Planning and Control** 3.8.1 Work activities shall be identified, planned, sequenced, resourced, assigned, defined, controlled and verified. **4.5 Operator Surveillance** 4.5.1 The plant and equipment, including control room and field areas, shall be routinely monitored to ensure that equipment is in good working order. 4.5.2 The frequency of routine monitoring shall be such that problems are detected in a timely manner.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	8.2 Methods *Inspection methods shall be established and executed to verify that the characteristics of an item continue to remain within specified limits. Inspection methods shall include evaluations of performance capability of essential emergency and safety systems and equipment, verification of calibration and integrity of instruments and instrument systems, and verification of maintenance, as appropriate.*	**N286.5-95** **4.5 Operator Surveillance** 4.5.1 The plant and equipment, including control room and field areas, shall be routinely monitored to ensure that equipment is in good working order.	The N286 series of standards does not specify an explicit list of inspection methods, which includes evaluations of performance capability of essential emergency and safety systems and equipment, verification of calibration and integrity of instruments and instrument systems, and verification of maintenance, as appropriate.	No Significant Difference; No Impact on the ACR QA Program.

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	9. RECORDS *Records shall, as a minimum, identify (a) through (f) below:* *a) item inspected* *b) date of inspection* *c) inspector* *d) type of observation* *e) results or acceptability* *f) reference to information on action taken in connection with nonconformances.*	**Z299.1-85** **3.5.16 Quality Records** (a) Maintain quality records as objective evidence that (i) the quality assurance program meets the requirements of this Standard; (ii) the product or service and documentation meet specified requirements; (iii) personnel, procedures, documentation, and equipment for special processes are qualified, as required by Clause 3.5.14.3(c); (iv) selection, surveillance, and audit of subsuppliers are met, as required by Clause 3.5.5(a), (b), and (d); (v) corrective action is being taken and is effective as required by Clause 3.5.18. (b) Include in Item (a) above quality audit records which identify (i) audited procedures, processes, products, and services; (ii) results obtained; (iii) analyses of audit data and resultant corrective action taken. (c) Include in Item (a) above records of management review and correction of deficiencies required by Clause 3.2.2. (d) Include in Item (a) above the Quality Assurance Manual review records which identify all revisions required by Clause 3.3(c)(iv). Continue below	Canadian manufacturing standards in the CSA Z299 series and the CSA N286 series of standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	(e) Include in Item (a) above records of verifications and product or service inspections and tests which identify (i) either the reference document number and revision or part number of the product r service; (ii) applicable requirements; (iii) specific verifications, inspections, and tests performed and results obtained; if measurements are not required include the basis of acceptance; (iv) nonconformance reports (see Clauses 3.5.17.2 (c) and 3.5.17.3 (c)); (v) feedback or corrective action generated; (vi) dates of inspections or tests; (vii) verifiers or inspectors; (viii) data recording instruments as specified in the Inspection and Test Plan(s). (f) Make quality records available to the customer representative for analysis and review. (g) Identify, index, and file quality records for prompt retrieval up to the time of customer acceptance of the product or service and for sure retrieval for the time specified in the contract. (h) Define and provide the environment needed to minimize deterioration or damage and to prevent loss of records. **N286.3-99** **3.9.3.2 Receiving** 3.9.3.2.2 In addition, it shall be established that evidence is available that a) the item received was fabricated, tested, and inspected prior to shipment in accordance with, and meets, the applicable code, specification, purchase order, and/or drawings; b) the documentation requirements of the purchase order for the item have been met; and c) the documentation has been reviewed by an organization other than the issuer of the documentation to ensure that the technical requirements of the item have been met.	See above.	

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XI. TEST CONTROL A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents	**BASIC REQUIREMENT 11: TEST CONTROL** Tests required to verify conformance of an item or computer program to specified requirements and to demonstrate satisfactory performance for service shall be planned and executed. Characteristics to be tested and test methods to be employed shall be specified. Test results shall be documented and their conformance with acceptance criteria shall be evaluated. Tests required to collect data, such as for siting or design input, shall be planned, executed, documented, and evaluated.	**N286.2-00** **5.6 Design Verification** 5.6.6 The purpose of qualification testing a prototype or initial production unit is to verify the design or specific design features. In the case of the latter, the other features of the design shall be verified by other means. Reports of such qualification testing shall be reviewed for validity and for relevancy to design requirements. Organizations performing qualification testing shall have a qualification testing program that meet the requirements of Clause 6. 5.6.7 Computer programs that are to be used to control plant systems shall be verified to a documented plan that defines the a) test method to be used; b) input to be processed; and c) output acceptance criteria. The development of such computer programs shall be in accordance with a quality assurance Standard. **N286.3-99** **3.9.3.2 Receiving** 3.9.3.2.2 In addition, it shall be established that evidence is available that a) the item received was fabricated, tested, and inspected prior to shipment in accordance with, and meets, the applicable code, specification, purchase order, and/or drawings; b) the documentation requirements of the purchase order for the item have been met; and c) the documentation has been reviewed by an organization other than the issuer of the documentation to ensure that the technical requirements of the item have been met.	Both standards have similar requirements. This includes requirements for testing control system software and analytical and design software.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.7-99** **6.7 Coding and Its Verification** The coding phase shall consist of translating the design into computer language, debugging the resulting computer program, and integrating computer program modules. Examples of recommended programming practices are contained in Appendix A. Verification of coding shall be performed as defined in the development plan. Examples of verification methods are walkthrough, independent review of computer program text, mathematical analysis of the computer program functions, and testing. Persons performing the verification shall be qualified and independent of those performing the coding. Verification activities shall be documented as specified in Clause 11.2.6.	See above.	
	SUPPLEMENT 11S-1 ***Supplementary Requirements for Test Control*** ***1. GENERAL*** *This Supplement provides amplified requirements for test control. It supplements the requirements of Basic Requirement ii of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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XI. TEST CONTROL Cont'd The test program shall include, as appropriate, proof tests prior to installation, preoperational tests, and operational tests during nuclear power plant or fuel reprocessing plant operation, of structures, systems and components.	***2. TEST REQUIREMENTS*** *Test requirements and acceptance criteria shall be provided or approved by the organization responsible for the design of the item to be tested unless otherwise designated. Required tests, including, as appropriate, prototype qualification tests, production tests, proof tests prior to installation, construction tests, pre-operational tests, and operational tests shall be controlled.*	**N286.2-00** **6.7.2 Test Program** A document shall be produced that gives directly or by reference a) a list of test to be performed; b) the objectives of the tests; c) the test conditions; d) the acceptance criteria; e) the reports required; and f) other essential information. **Z299.1-85** **3.5.6 Inspection and Test Plans** 3.5.6.2 Identify in the Inspection and Test Plan(s) (a) what products or services are to be subcontracted and specify the quality assurance programs to be applied; (b) how the supplier will verify the subsupplier's conformance to specified requirements by one or more of the following methods: (i) inspection and test by the subsupplier as defined in the subsupplier's Inspection and Test Plan(s); (ii) inspection and test by the supplier at the sub-supplier's facility; (iii) surveillance by the supplier; (vi) incoming inspection; (c) where each inspection and test point is located in the production cycle, including incoming inspection, preservation of products, packaging, and site inspection and testing; if the supplier intends to perform additional in-process inspections and tests for his own evaluation of quality, they shall be indicated; the fact that they are not subject to customer representative acceptance shall also be indicated: (d) what characteristics are to be inspected and tested at each point and specify or reference inspection and test procedures, sampling plans, and acceptance criteria to be used; Continued below	Generally the CSA N286 series of standards and Canadian manufacturing standards have similar requirements to those in ASME NQA-1-1994.	No Significant Difference; No Impact on the ACR QA Program.

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	See above	(e) inspection and test points where a history of usage of measuring and test equipment shall be maintained so that assessments required by Clause 3.5.4(m) can be met; (f) where the customer has established witness or verification points for selected characteristics of a product or service and beyond which the work shall not proceed; (g) where and how product acceptance to special production process procedures will be accomplished and documented as specified in Clause 3.5.14; (h) where statistical process control techniques will be used for product acceptance; (i) where lots or batches will be used; and (j) what will be included in the review required by Clause 3.5.9(b) **N286.3-99** **3.10.3 Inspection and Test** 3.10.3.1 Inspections and tests shall be carried out in accordance with approved procedures that will provide for: a) identification of the reference documents that specify the inspection or test requirements; b) identification of characteristics to be inspected or tested; c) acceptance criteria; d) a description of the method of inspection or test, including the equipment to be used and the conditions that must be controlled; and e) identification of the individuals or groups responsible for performing the activities. See below	See above.	

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	See above.	**N286.4-86** **4.1 Work Control** 4.1.1 Commissioning activities shall be planned and documented in such a way as to meet the objectives of the commissioning quality assurance program. Planning shall include the identification and integration of the methods, requirements, and organizational responsibilities for all such commissioning activities. **N286.5-95** **6.2 Surveillance Testing** 6.2.1 Systems shall be tested periodically to ensure that equipment and software will function as required. 6.2.2 The frequency of testing shall be related to the results of reliability analysis and operational experience.	See above.	
	2. TEST REQUIREMENTS Cont'd *Test requirements and acceptance criteria shall be based upon specified requirements contained in applicable design or other pertinent technical documents.*	**N286.2-00** **5.2 Design Input** 5.2.3 Design requirements shall be in sufficient detail to provide a reference base for making decisions, performing design verification, and evaluating design changes. **N286.5-95** **3.13 Change Control** 3.13.1 Permanent and temporary changes to accepted designs, items, computer software, processes and practices shall be a) reviewed and approved before they are implemented; b) reviewed and approved by persons who have full knowledge of the original and current intent and requirements; and c) documented.	The N286 series of standards does not have explicit requirements linking test requirements to specific requirements in design documents.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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XI. TEST CONTROL Cont'd Test procedures shall include provisions 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.	***3. TEST PROCEDURES*** *Test procedures shall include or reference test objectives and provisions for assuring that prerequisites for the given test have been met, that adequate instrumentation is available and used, that necessary monitoring is performed, and that 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.* *In lieu of specially prepared written test procedures, appropriate sections of related documents, such as ASTM methods, Supplier manuals, equipment maintenance instructions, or approved drawings or travelers with acceptance criteria, can be used. Such documents shall include adequate instructions to assure the required quality of work*	**N286.2-00** **6.7.3 Test Procedures** Written test procedures shall be issued to augment the information given in the test program. These instructions shall define: a) test facilities to be used; b) test pieces; c) test preparation; d) testing; e) data to be recorded; f) test reports; and g) witnessing of testing activities. **6.7.4 Test Facilities** 6.7.4.1 Measuring and testing equipment shall be controlled and maintained. 6.7.4.2 Information on each article of measuring or testing equipment shall be available and shall a) define the equipment (e.g., type, model number, serial number); b) define it use; c) define its capabilities; d) contain operation and maintenance instructions; e) give calibration status; and f) define calibration frequency.	The CSA N286 series of standards has similar requirements to those in ASME NQA-1-1994. Note that CSA N286.4-86 is dedicated entirely to commissioning and tests performed during commissioning. CSA Z299.1, Clause 3.5.6 provides detailed requirements for planning inspection and testing activities during manufacturing.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.4-86** **4.1 Work Control** 4.1.2 Work done to commission equipment and systems shall be performed in conformance with written procedures prepared prior to the execution of the work. Deviations from procedures shall be approved. 4.1.3 The format of such procedures may vary from plant to plant, depending upon the policies of the owner organization. As a minimum, the following areas shall be addressed: (a) Title. Each procedure shall contain a title description of the activity, system, or equipment to which it applies, a revision number, a date, and an approval status. (b) Statement of Applicability. The purpose for which the procedure is intended shall be clearly stated. (c) References. References shall be included where appropriate. (d) Prerequisites. Each procedure, prior to its use, shall identify those independent actions or procedures which must be completed and those plant conditions which must exist. (e) Precautions. Precautions shall be identified to alert the individual performing the task to those measures which are to be used to protect equipment and personnel or to avoid an abnormal or emergency situation, or both. Continued below	See above.	

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	See above.	(f) Limitations and Actions. Limitations on the parameters being controlled and, if required, appropriate corrective measures to return the parameter to within normal limits shall be specified. (g) Main Body. The main body of the procedure shall contain step-by-step instructions in as much detail as necessary for the performance of the particular commissioning activity. (h) Acceptance Criteria. Procedures shall contain, where applicable, acceptance criteria against which the success or failure of the activity is to be judged. (i) Check-Off Lists. Complex procedures shall contain check-off lists, either included in the procedure or referenced.	See above.	
XI. TEST CONTROL Cont'd Test results shall be documented and evaluated to assure that test requirements have been satisfied.	***4. TEST RESULTS*** *Test results shall be documented and evaluated by a responsible authority to assure that test requirements have been satisfied.*	**N286.2-00** **5.6 Design Verification** The purpose of qualification testing a prototype or initial production unit is to verify the design or specific design features. In the case of the latter, the other features of the design shall be verified by other means. Reports of such qualification testing shall be reviewed for validity and for relevancy to design requirements. Organizations performing qualification testing shall have a qualification testing program that meet the requirements of Clause 6. **6.7.9 Test Reports** Test report shall be prepared. Test report requirement shall be established for: a) format and presentations; b) identification; c) content, including information on the test pieces, the test performed, the data collected, and the conclusions drawn from the result obtained; d) indication of status; e) verification and approval; f) revisions; g) issuance and distribution; and h) storage and retrieval of originals and masters.	Both standards have similar requirements regarding qualification testing.	No Significant Difference; No Impact on the ACR QA Program.

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	5. TEST RECORDS *Test records shall, as a minimum, identify (a) through (g) below:* 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*	**N286.2-00** **6.7.9 Test Reports** Test report shall be prepared. Test report requirement shall be established for: a) format and presentations; b) identification; c) content, including information on the test pieces, the test performed, the data collected, and the conclusions drawn from the result obtained; d) indication of status; e) verification and approval; f) revisions; g) issuance and distribution; and h) storage and retrieval of originals and masters.	Both standards have similar requirements regarding qualification testing.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 11S-2 ***Supplementary Requirements for Computer Program Testing*** ***1. GENERAL*** *This Supplement provides amplified requirements for testing of computer programs and associated computer systems. It supplements the requirements of Basic Requirement 11 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. TEST REQUIREMENTS *Test requirements and acceptance criteria shall be provided or approved by the organization responsible for the design or use of the program to be tested unless otherwise designated. Required tests including (as appropriate) verification tests, hardware integration tests, and in-use tests shall be controlled. Test requirements and acceptance criteria shall be based upon applicable design or other pertinent technical documents.*	**N286.2-00** **5.5 Design Adequacy** 5.5.2 The identification, use, validation, and revision of computer programs employed in the design process shall be controlled. Note: The quality assurance program requirements for design and analytical computer programs are defined in CSA Standard N286.7. 5.5.3 When computer programs are used in design or analytical work, the program description, instructions for use, validation reports, changes to the programs, and results shall be documented. 5.5.4 When analytical work is performed, the inputs, assumptions, methods, modeling, test and development work, and results shall be documented. **5.6 Design Verification** 5.6.7 Computer programs that are to be used to control plant systems shall be verified to a documented plan that defines the a) test method to be used; b) input to be processed; and c) output acceptance criteria. The development of such computer programs shall be in accordance with a quality assurance Standard.	The N286 series of standards specifies a basic requirement that both analytical/design computer programs and control systems software be subject to verification. However, the N286 series of standards does not have the explicit requirements for verification tests, hardware integration tests, and in-use tests. The N286 series of standards also does not specify that test requirements and acceptance criteria shall be based upon applicable design or other pertinent technical documents.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.7-99** **6.7 Coding and Its Verification** The coding phase shall consist of translating the design into computer language, debugging the resulting computer program, and integrating computer program modules. Examples of recommended programming practices are contained in Appendix A. Verification of coding shall be performed as defined in the development plan. Examples of verification methods are walkthrough, independent review of computer program text, mathematical analysis of the computer program functions, and testing. Persons performing the verification shall be qualified and independent of those performing the coding. Verification activities shall be documented as specified in Clause 11.2.6.	See above.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2.1 Verification Tests *Verification tests shall demonstrate the capability of the computer program to produce valid results for test problems encompassing the range of permitted usage defined by the program documentation. Acceptable test problem solutions are as follows:* a) *hand calculations;* b) *calculations using comparable proven programs; or* c) *empirical data and information from technical literature.* *For programs used for operational control, testing shall demonstrate required performance over the range of operation of the controlled function or process.* *Depending on the complexity of the computer program being tested, testing may range from a single test of the completed computer program to a series of tests performed at various stages of computer program development to verify correct translation between stages and proper working of individual modules, followed by an overall computer program test. Regardless of the number of stages of testing performed, verification testing shall be sufficient to establish that test requirements are satisfied and that the computer program produces a valid result for its intended function.*	**N286.2-00** **5.6 Design Verification** 5.6.7 Computer programs that are to be used to control plant systems shall be verified to a documented plan that defines the a) test method to be used; b) input to be processed; and c) output acceptance criteria. The development of such computer programs shall be in accordance with a quality assurance Standard. **N286.7-99** **6.7 Coding and Its Verification** The coding phase shall consist of translating the design into computer language, debugging the resulting computer program, and integrating computer program modules. Examples of recommended programming practices are contained in Appendix A. Verification of coding shall be performed as defined in the development plan. Examples of verification methods are walkthrough, independent review of computer program text, mathematical analysis of the computer program functions, and testing. Persons performing the verification shall be qualified and independent of those performing the coding. Verification activities shall be documented as specified in Clause 11.2.6.	The N286 series of standards has similar requirements to those in ASME NQA-1-1994 regarding design and analytical software. The CSA N286 series of standards specifies only limited requirements regarding control systems software.	No Significant Difference; No Impact on the ACR QA Program. Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above	**N286.7-99** **9. Validation** Validation shall provide information sufficient to permit the determination of appropriate uncertainty allowances with respect to the intended application. Examples of validation methods include comparison of the computer program results with experimental data; commissioning data and operating experience; results of hand calculations; solutions to standard or benchmark problems; closed mathematical solutions; and results of another validated computer program. Conclusions regarding validation shall take into account the accuracy of the information against which the computer program is being validated. Computer program validation results shall be reproducible and documented as specified in Clause 11.3.5. Computer program validation shall be performed by qualified persons. Validation reports shall be reviewed by qualified persons who did not participate in the validation (see Clause 1.3 for references to related requirements in the other N286 Standards).	See above.	

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	2.2 In-Use Tests *Test problems shall be developed and documented to permit confirmation of acceptable performance of the computer program in the operating system. Test problems shall be run whenever the computer program is installed on a different computer, or when significant hardware or operating system configuration changes are made. Periodic in-use manual or automatic self-check routines shall be prescribed and performed for those applications where computer failures or drift can affect required performance.*	**N286.7-99** **10.1 Requirements for Use** Each organization shall ensure the proper use of computer programs by requiring that a) computer programs are validated for the intended use; b) only those physical states are analyzed that are within the documented range of the computer program's applicability; c) the input data is verified to ensure that it adequately represents the physical system or process analyzed; d) the derivations and sources of input data are documented in a form that facilitates independent review; e) the configuration of the computer program and the input data are identified so that results can be reproduced; f) the results produced by the computer program are reviewed to confirm that they are reasonable; and g) user qualifications are specified and the necessary training is provided to minimize the effect of user dependency.	Both standards have similar requirements regarding design and analytical software. The CSA N286 series of standards does not address these requirements for control systems software. For any type of software the CSA N286 series of standards does not address the requirements for periodic in-use manual or automatic self-check in-use tests.	No Significant Difference; No Impact on the ACR QA Program. Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	3. TEST PROCEDURES *Test procedures or plans shall specify the following, as applicable:* a) *required tests and test sequence* b) *required ranges of input parameters* c) *identification of the stages at which testing is required* d) *criteria for establishing test cases* e) *requirements for testing logic branches* f) *requirements for hardware integration* g) *anticipated output values* h) *acceptance criteria* i) *reports, records, standard formatting, and conventions*		The N286 series of standards does not specify such a detailed list of requirements for test procedures.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	4. TEST RESULTS *Test results shall be documented. Verification test results shall be evaluated by a responsible authority to assure that test requirements have been satisfied.*	**N286.2-00** **5.6 Design Verification** The purpose of qualification testing a prototype or initial production unit is to verify the design or specific design features. In the case of the latter, the other features of the design shall be verified by other means. Reports of such qualification testing shall be reviewed for validity and for relevancy to design requirements. Organizations performing qualification testing shall have a qualification testing program that meet the requirements of Clause 6. **6.7.9 Test Reports** Test report shall be prepared. Test report requirement shall be established for: a) format and presentations; b) identification; c) content, including information on the test pieces, the test performed, the data collected, and the conclusions drawn from the result obtained; d) indication of status; e) verification and approval; f) revisions; g) issuance and distribution; and h) storage and retrieval of originals and masters. **N286.7** 11.2.6 The verification reports shall document the verification activities identified either in the development or in the change control plan, as appropriate. The reports shall contain a) requirements against which items are verified; b) the method(s) and acceptance criteria used; c) the verification results; and d) disposition of anomalies.	Both standards have similar requirements regarding qualification testing and testing of design and analytical software. The CSA N286 series of standards does not address the ASME NQA-1-1994 requirements regarding control systems software.	No Significant Difference; No Impact on the ACR QA Program. Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	5. TEST RECORDS a) *Verification test records shall identify (1) through (10) below.* *1) computer program tested* *2) computer hardware used* *3) test equipment and calibrations, where applicable* *4) date of test* *5) tester or data recorder* *6) simulation models used, where applicable* *7) test problems* *8) results and acceptability* *9) action taken in connection with any deviations noted* *10) person evaluating test results* b) *In-use test results shall identify (1) through (6) below.* *1) computer program tested* *2) computer hardware used* *3) test equipment and calibrations, where applicable* *4) date of test* *5) tester or data recorder* *6) acceptability*	**N286.2-00** **6.7.9 Test Reports** Test report shall be prepared. Test report requirement shall be established for: a) format and presentations; b) identification; c) content, including information on the test pieces, the test performed, the data collected, and the conclusions drawn from the result obtained; d) indication of status; e) verification and approval; f) revisions; g) issuance and distribution; and h) storage and retrieval of originals and masters. **N286.7** **11.2.6 Verification Reports** The verification reports shall document the verification activities identified either in the development or in the change control plan, as appropriate. The reports shall contain a) requirements against which items are verified; b) the method(s) and acceptance criteria used; c) the verification results; and d) disposition of anomalies.	The N286 series of standards does not specify requirements for test records to the same level of detail as does NQA-1-1994.	No Significant Difference; No Impact on the ACR QA Program.

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XII. CONTROL OF MEASURING AND TEST EQUIPMENT Measures shall be established 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.	**BASIC REQUIREMENT 12: CONTROL OF MEASURING AND TEST EQUIPMENT** Tools, gages, instruments, and other measuring and test equipment used for activities affecting quality shall be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits.	**N286.2-00** **6.7.4 Test Facilities** 6.7.4.3 At prescribed intervals and prior to use, measuring and testing equipment shall be calibrated and adjusted against certified equipment having a known valid relationship to recognized standards. **N286.3-99** **3.10.5 Measuring and Test Equipment** 3.10.5.1 Measures shall be established and documented to ensure that tools, gauges, instruments, and other inspection, measuring, and testing equipment, as well as other devices that can affect quality, are of the proper range, type, and accuracy. **N286.4-86** **4.5 Measuring and Test Equipment** 4.5.1 Procedures shall be implemented to ensure that all measuring and testing equipment is of the proper range, type, condition, and accuracy to establish conformance to specified requirements. **N286.5-95** **5.8 Measuring and Test Equipment** 5.8.2 To ensure accuracy within limits, adjustment, maintenance and calibration shall be against equipment having a known relationship to nationally recognized standards. Where no such national standards exist, the basis for calibration shall be documented. 5.8.3 The method and frequency of calibration shall be defined on the basis of the accuracy required, the equipment type, its stability and reliability characteristics, and other relevant factors.	Both standards have similar requirements regarding measuring and testing equipment Unlike ASME NQA-1-1994, CSA N286.5-95 has specific requirements regarding calibration of system instrumentation**.** Clause 5.6, Calibration of System Instrumentation, of CSA N286.5-95 specifies: 5.6.1 System instrumentation shall be maintained in a condition to ensure operation within specified limits. 5.6.2 The basis, method and frequency of calibration shall be defined. Measuring and testing equipment (see Clause 5.8) shall be used to calibrate system instrumentation. 5.6.3 When system instrumentation is found to be out of calibration, the consequence on past and present performance shall be reviewed and evaluated.	No Significant Difference; No Impact on the ACR QA Program.

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	SUPPLEMENT 12S-1 ***Supplementary Requirements for Control of Measuring and Test Equipment*** ***1. GENERAL*** *This Supplement provides amplified requirements for control of measuring and test equipment. It supplements the requirements of Basic Requirement 12 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below
	2. SELECTION *Selection of measuring and test equipment shall be controlled to assure that such items are of proper type, range, accuracy, and tolerance to accomplish the function of determining conformance to specified requirements.*	**N286.2-00** **6.7.4 Test Facilities** 6.7.4.2 Information on each article of measuring or testing equipment shall be available and shall a) define the equipment (e.g., type, model number, serial number); b) define its use; c) define its capabilities; d) contain operation and maintenance instructions; e) give calibration status; and f) define calibration frequency. **N286.3-99** **3.10.5 Measuring and Test Equipment** 3.10.5.1 Measures shall be established and documented to ensure that tools, gauges, instruments, and other inspection, measuring, and testing equipment, as well as other devices that can affect quality, are of the proper range, type, and accuracy. **N286.4-86** **4.5 Measuring and Test Equipment** 4.5.1 Procedures shall be implemented to ensure that all measuring and testing equipment is of the proper range, type, condition, and accuracy to establish conformance to specified requirements. **N286.5-95** **5.8 Measuring and Test Equipment** 5.8.1 Measuring and testing equipment shall be of the proper range, type, condition and accuracy to establish conformance to specified requirements.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	3. CALIBRATION AND CONTROL ***3.1 Calibration*** *Measuring and test equipment shall be calibrated, adjusted, and maintained at prescribed intervals or, prior to use, against certified equipment having known valid relationships to nationally recognized standards. If no nationally recognized standards exist, the bases for calibration shall be documented.*	**N286.2-00** **6.7.4 Test Facilities** 6.7.4.3 At prescribed intervals and prior to use, measuring and testing equipment shall be calibrated and adjusted against certified equipment having a known valid relationship to recognized standards. **N286.3-99** **3.10.5 Measuring and Test Equipment** 3.10.5.2 Such equipment shall be calibrated and maintained, at prescribed intervals or prior to use, against equipment having a known valid relationship to nationally recognized standards. If no national standards exist, the basis for calibration shall be documented. Calibration shall also be performed when accuracy of the equipment is suspect. **N286.4-86** **4.5 Measuring and Test Equipment** 4.5.2 All such equipment shall be adjusted, maintained, and calibrated against equipment having a known relationship to nationally recognized standards, as necessary, to ensure that it is accurate within required limits when it is used for commissioning activities. Where no such standard exists, the basis for calibration shall be documented. Records of adjustment, maintenance, and calibration shall be maintained, and equipment shall be suitably identified or marked, so as to enable the user to establish its calibration status.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.5-95** 5.8 Measuring and Test Equipment 5.8.2 To ensure accuracy within limits, adjustment, maintenance and calibration shall be against equipment having a known relationship to nationally recognized standards. Where no such national standards exist, the basis for calibration shall be documented. 5.8.3 The method and frequency of calibration shall be defined on the basis of the accuracy required, the equipment type, its stability and reliability characteristics, and other relevant factors.	See above.	

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	3.2 Control *The method and interval of calibration for each item shall be defined, based on the type of equipment stability characteristics, required accuracy, intended use, and other conditions affecting measurement control. When measuring and test equipment is found to be out of calibration, an evaluation shall be made and documented of the validity of previous inspection or test results and of the acceptability of items previously inspected or tested. Out-of-calibration devices shall be tagged or segregated and not used until they have been recalibrated. If any measuring or test equipment is consistently found to be out of calibration, it shall be repaired or replaced. A calibration shall be performed when the accuracy of the equipment is suspect.*	**N286.2-00** **6.7.4 Test Facilities** 6.7.4.2 Information on each article of measuring or testing equipment shall be available and shall a) define the equipment (e.g., type, model number, serial number); b) define it use; c) define its capabilities; d) contain operation and maintenance instructions; e) give calibration status; and f) define calibration frequency. 6.7.4.3 At prescribed intervals and prior to use, measuring and testing equipment shall be calibrated and adjusted against certified equipment having a known valid relationship to recognized standards. **N286.3-99** **3.10.5 Measuring and Test Equipment** 3.10.5.2 Such equipment shall be calibrated and maintained, at prescribed intervals or prior to use, against equipment having a known valid relationship to nationally recognized standards. If no national standards exist, the basis for calibration shall be documented. Calibration shall also be performed when accuracy of the equipment is suspect. 3.10.5.3 The method and interval of calibration for each type of equipment shall be documented. 3.10.5.4 When inspection, measuring, or test equipment is found to be out of calibration, an evaluation shall be made and documented of the validity of previous inspection or test results and of the acceptability of items previously inspected or tested. If any inspection, measuring, or test equipment is found to be out of calibration, it shall be repaired or replaced.	For qualification testing, CSA N286.2-00 does not require specifically that out of calibration devices be quarantined and that equipment consistently out of calibration be repaired or replaced. For construction, CSA N286.3-99 and ASME NQA-1-1994 have similar requirements.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR and its suppliers' QA Programs.

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	See above.	**N286.4-86** **4.5 Measuring and Testing Equipment** 4.5.2 All such equipment shall be adjusted, maintained, and calibrated against equipment having a known relationship to nationally recognized standards, as necessary, to ensure that it is accurate within required limits when it is used for commissioning activities. Where no such standard exists, the basis for calibration shall be documented. Records of adjustment, maintenance, and calibration shall be maintained, and equipment shall be suitably identified or marked, so as to enable the user to establish its calibration status. 4.5.3 If the accuracy of an instrument or item of equipment becomes suspect, it shall be checked. Where an instrument or item of equipment is found to be out of calibration, an evaluation shall be made of the acceptability of the items previously measured or tested by this instrument or item of equipment since the date of its last acceptable calibration.	CSA N286.4-86 does not provide explicitly that out of calibration equipment shall be repaired or replaced.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR and its suppliers' QA Programs.

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	See above.	**N286.5-96** **5.8 Measuring and Testing Equipment** 5.8.2 To ensure accuracy within limits, adjustment, maintenance and calibration shall be against equipment having a known relationship to nationally recognized standards. Where no such national standards exist, the basis for calibration shall be documented. 5.8.3 The method and frequency of calibration shall be defined on the basis of the accuracy required, the equipment type, its stability and reliability characteristics, and other relevant factors. 5.8.4 Records of adjustment, maintenance, and calibration shall be maintained, and, where possible, equipment shall be suitably marked to enable the user to readily identify its calibration status. 5.8.5 If the accuracy of any measuring and test equipment becomes suspect, it shall be checked. 5.8.6 When deviations beyond prescribed accuracy limits are found, an evaluation shall be made of the validity and acceptability of previous readings, measurements, or tests since the date of the last acceptable calibration.	CSA N286.5.95 does not provide explicitly that out of calibration equipment shall be repaired or replaced.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR and its suppliers' QA Programs.

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	See above.	**N286.3-99** **3.10.5 Measuring and Test Equipment** 3.10.5.4 When inspection, measuring, or test equipment is found to be out of calibration, an evaluation shall be made and documented of the validity of previous inspection or test results and of the acceptability of items previously inspected or tested. If any inspection, measuring, or test equipment is found to be out of calibration, it shall be repaired or replaced. **N286.4-86** **4.5 Measuring and Testing Equipment** 4.5.3 If the accuracy of an instrument or item of equipment becomes suspect, it shall be checked. Where an instrument or item of equipment is found to be out of calibration, an evaluation shall be made of the acceptability of the items previously measured or tested by this instrument or item of equipment since the date of its last acceptable calibration. **N286.5-95** **5.8 Measuring and Testing Equipment** 5.8.6 When deviations beyond prescribed accuracy limits are found, an evaluation shall be made of the validity and acceptability of previous readings, measurements, or tests since the date of the last acceptable calibration.	For qualification testing CSA N286.2-00 does not specify a requirement to evaluate the consequences of out of calibration equipment. For construction, commissioning, and operations CSA N286.3-99, CSA N286.4-86, CSA N286.5-95 and ASME NQA-1 have similar requirements.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR and its suppliers' QA Programs.
	3.3 Commercial Devices *Calibration and control measures may not be required for rulers, tape measures, levels, and other such devices, if normal commercial equipment provides adequate accuracy.*		The CSA N286 series of standards is silent with respect to "commercial devices" as defined in ASME NQA-1-1994.	No Significant Difference; No Impact on the ACR QA Program.
	4. HANDLING AND STORAGE *Measuring and test equipment shall be properly handled and stored to maintain accuracy.*	**N286.5-95** **5.8 Measuring and Testing Equipment** 5.8.7 All measuring and test equipment shall be stored in a manner to protect it from loss, deterioration, or destruction.	For qualification testing, construction, and commissioning CSA N286.2-00, CSA N286.3-99, and CSA N286.4-86 do not specify requirements regarding handling and storage of measuring and testing equipment. N286.5-95 and ASME NQA-1-1994 have similar requirements regarding storage and handling of measuring and testing equipment.	No Significant Difference; No Impact on the ACR QA Program.

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	5. RECORDS *Records shall be maintained and equipment shall be suitably marked to indicate calibration status.*	**CSA N286.4-86** **4.5 Measuring and Testing Equipment** All such equipment shall be adjusted, maintained, and calibrated against equipment having a known relationship to nationally recognized standards, as necessary, to ensure that it is accurate within required limits when it is used for commissioning activities. Where no such standard exists, the basis for calibration shall be documented. Records of adjustment, maintenance, and calibration shall be maintained, and equipment shall be suitably identified or marked, so as to enable the user to establish its calibration status. **N286.5-95** **5.8 Measuring and Testing Equipment** 5.8.4 Records of adjustment, maintenance, and calibration shall be maintained, and, where possible, equipment shall be suitably marked to enable the user to readily identify its calibration status.	For qualification testing and construction, CSA N286.2-00 and CSA N286.3-99 do not specify requirements regarding calibration records. For commissioning and operations CSA N286.4-86 and CSA N286.5-95 have similar requirements to those in ASME NQA-1-1994.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR and its suppliers' QA Programs.

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XIII. HANDLING, STORAGE AND SHIPPING Measures shall be established to control the handling, storage, shipping, cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration.	**BASIC REQUIREMENT 13: HANDLING, STORAGE, AND SHIPPING** Handling, storage, cleaning, packaging, shipping, and preservation of items shall be controlled to prevent damage or loss and to minimize deterioration.	**N286.3-99** **3.9.3 Receiving, Storage, and Handling of Items** **3.9.3.1 General** Measures shall be established and documented to control receiving, storage, and handling of items in accordance with established instructions, procedures, or drawings from the time of receipt of the item until transfer of responsibility to either the commissioning or operating organizations. **N286.4-86** **4.4.3 Handling and Storage** 4.4.3.1 Measures shall be implemented to control handling and storage in order to preserve items from the time of their receipt and prevent their abuse, misuse, damage, deterioration, or loss. **N286.5-95** **5.9.6 Handling and Storage** 5.9.6.1 Handling and storage of replacement items shall be controlled to prevent their a) abuse; b) misuse; c) damage; d) deterioration; or e) loss.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 13S-1 ***Supplementary Requirements for Handling, Storage, and Shipping*** ***1. GENERAL*** *This Supplement provides amplified requirements for handling, storage, and shipping. It supplements the requirements of Basic Requirement 13 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2. INSTRUCTION *Handling, storage, and shipping of items shall be conducted in accordance with established work and inspection instructions, drawings, specifications, shipment instructions, or other pertinent documents or procedures specified for use in conducting the activity.*	**N286.3-99** **3.9.3 Receiving, Storage, and Handling of Items** **3.9.3.1 General** Measures shall be established and documented to control receiving, storage, and handling of items in accordance with established instructions, procedures, or drawings from the time of receipt of the item until transfer of responsibility to either the commissioning or operating organizations. **N286.4-86** **4.4.3 Handling and Storage** 4.4.3.1 Measures shall be implemented to control handling and storage in order to preserve items from the time of their receipt and prevent their abuse, misuse, damage, deterioration, or loss. **N286.5-95** **5.9.6 Handling and Storage** 5.9.6.1 Handling and storage of replacement items shall be controlled to prevent their f) abuse; g) misuse; h) damage; i) deterioration; or j) loss.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
XIII. HANDLING, STORAGE AND SHIPPING Cont'd When necessary for particular products, special protective environments, such as inert gas atmosphere, specific moisture content levels, and temperature levels, shall be specified and provided.	***3. REQUIREMENTS*** ***3.1 General*** *When required for particular items, special equipment (such as containers, shock absorbers, and accelerometers) and special protective environments (such as inert gas atmosphere, specific moisture content levels, and temperature levels) shall be specified, provided, and their existence verified.*	**N286.3-99** **3.9.3.3 Storage and Handling** 3.9.3.3.4 When special handling tools and equipment are required, they shall be inspected and tested at specified times to verify that they are adequately maintained. **N286.4-86** **4.4.3 Handling and Storage** 4.4.3.3 When special handling tools and equipment are required, they shall be inspected and tested at specified times to verify that they are adequately maintained.	CSA N286.5-95 does not address explicitly the requirements on special handling tools and equipment specified in ASME NQA-1-1994, e.g.: • Provide and specify special equipment (such as containers, shock absorbers, and accelerometers); • Provide and specify special protective environments (such as inert gas atmosphere, specific moisture content levels, and temperature levels); and • Verify their existence.	N/A (This QA element is not applicable for the ACR Design Certification phase).

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	3.2 Procedures *When required for critical, sensitive, perishable, or high-value articles, specific procedures for handling, storage, packaging, shipping, and preservation shall be used.*	**N286.3-99** **3.9.3.3 Storage and Handling** 3.9.3.3.1 Measures for the control of storage and handling shall be such as to preserve items from the time of their receipt and prevent their abuse, misuse, damage, deterioration, or loss. **N286.4-86** **4.4.3 Handling and Storage** 4.4.3.2 Handling instructions and procedures shall be provided for any material, equipment, and instrumentation that may be damaged if handled incorrectly. Other items not covered by a specific procedure shall be handled in accordance with sound material-handling practices. **N286.5-95** **5.9.6 Handling and Storage** 5.9.6.1 Handling and storage of replacement items shall be controlled to prevent their a) abuse; b) misuse; c) damage; d) deterioration; or e) loss.	The CSA N286 series of standards does not limit the requirement for proper handling to critical, sensitive, perishable, or high-value items.	N/A (This QA element is not applicable for the ACR Design Certification phase).
	3.3 Tools and Equipment *Special handling tools and equipment shall be utilized and controlled as necessary to ensure safe and adequate handling. Special handling tools and equipment shall be inspected and tested in accordance with procedures and at specified time intervals to verify that the tools and equipment are adequately maintained.*	**N286.3-99** **3.9.3.3 Storage and Handling** 3.9.3.3.4 When special handling tools and equipment are required, they shall be inspected and tested at specified times to verify that they are adequately maintained. **N286.4-86** **4.4.3 Handling and Storage** 4.4.3.3 When special handling tools and equipment are required, they shall be inspected and tested at specified times to verify that they are adequately maintained.	CSA N286.5-95 does not address explicitly the requirements on special handling tools and equipment specified in ASME NQA-1-1994.	N/A (This QA element is not applicable for the ACR Design Certification phase).

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	3.4 Operators *Operators of special handling and lifting equipment shall be experienced or trained in use of the equipment.*	**N286.3-99** **3.4 Personnel Capability** 3.4.1 Personnel responsible for construction activities shall have the necessary training and competence to perform their assigned tasks effectively. **N286.4-86** **3.5 Personnel Qualifications and Training** 3.5.1 Personnel involved in the implementation of the commissioning quality assurance program shall have the appropriate training, as well as the qualifications and the competence, necessary to perform effectively their assigned tasks. **N286.5-95** **3.4. Personnel Capability** 3.4.1 Personnel responsible for operations activities shall be competent to perform the tasks assigned to them.	The CSA N286 series of standards does not specify training and qualification requirements specifically for operators of special handling and lifting equipment. This requirement is covered in the CSA N286 series of standards under the general requirement for personnel being competent to perform the assigned tasks.	N/A (This QA element is not applicable for the ACR Design Certification phase).

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	4. MARKING *Instructions for marking and labeling for packaging, shipment, handling, and storage of items shall be established as necessary to adequately identify, maintain, and preserve the item, including indication of the presence of special environments or the need for special controls.*	**N286.3-99** **3.9.4 Identification and Traceability** 3.9.4.2 Physical identification shall be used to the maximum extent possible. Where physical identification is impracticable or insufficient, physical separation, procedural control, or other appropriate means shall be employed. Identification may be either on the item or on records traceable to the item. **N286.4-86** **4.4.2 Receiving** 4.4.2.1 Visual examination shall be performed to establish that (a) the item received is free from physical damage; (b) the specified packaging and shipping requirements have been maintained during shipping; and (c) identification and markings are in accordance with applicable codes, specifications, purchase orders, and drawings. **N286.5-95** **5.9.5 Receiving** 5.9.5.1 Materials shall be inspected at receipt to ensure that they are correct and free of apparent damage. Inspection shall establish that a) the item is packaged and shipped in accordance with the purchase order requirements; b) identification and markings are in accordance with the purchase order requirements; c) the related documentation includes the purchase order requirements for inspection and testing; d) the documentation has been reviewed by an organization other than the manufacturer to ensure that the purchase order requirements of the item have been met; and e) if an item requiring inspection by the owner was not inspected at source, the item shall be inspected at the point of receiving to verify conformance with purchase order requirements.	The CSA N286 series of standards and ASME NQA-1-1994 have similar requirements regarding marking or labelling of items for identification and traceability purposes. However, the CSA N286 series of standards does not address explicitly the requirement that marking and labelling also indicate maintenance and preservation requirements.	N/A (This QA element is not applicable for the ACR Design Certification phase).

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XIV. INSPECTION, TEST, AND OPERATING STATUS Measures shall be established to indicate, by the use of markings such as stamps, tags, labels, routing cards, or other suitable means, the status of inspections and tests performed upon individual items of the nuclear power plant or fuel reprocessing plant. These measures shall provide for the identification of items which have satisfactorily passed required inspections and tests, where necessary to preclude Inadvertent bypassing of such inspections and tests. Measures shall also be established for indicating the operating status of structures, systems, and components of the nuclear power plant or fuel reprocessing plant, such as by tagging valves and switches, to prevent inadvertent operation.	**BASIC REQUIREMENT 14: INSPECTION, TEST, AND OPERATING STATUS** The status of inspection and test activities shall be identified either on the items or in documents traceable to the items where it is necessary to assure that required inspections and tests are performed and to assure that items which have not passed the required inspections and tests are not inadvertently installed, used, or operated. Status shall be maintained through indicators, such as physical location and tags, markings, shop travelers, stamps, inspection records, or other suitable means. The authority for application and removal of tags, markings, labels, and stamps shall be specified. Status indicators shall also provide for indicating the operating status of systems and components of the nuclear facility, such as by tagging valves and switches, to prevent inadvertent operation.	**N286.3-99** **3.10.4 Inspection and Test Status** 3.10.4.1 Measures shall be established and documented to identify inspection and test status. Such measures shall ensure that required inspections and tests are performed and that the acceptability of items is known throughout construction. 3.10.4.2 The measures shall provide for inspection and test indicators such as stamps, tags, labels, routing cards, inspection records, or other suitable means. Appropriate procedures shall provide for the identification of those items which conform to inspection and test requirements and of those which do not. 3.10.4.3 Status indicators shall also show the operating status of the items, where appropriate. 3.10.4.4 Procedures shall be implemented for the control of the use of status indicators by authorized personnel only.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.4-86** **4.4.2 Receiving** 4.4.2.2 The associated documentation shall be examined to establish that (a) the item received was fabricated, tested, and inspected prior to shipment in accordance with and meets the applicable code, specification, purchase order, and/or drawings; (b) the documentation requirements of the purchase order for the item have been met; and (c) the documentation has been reviewed by an organization other than the manufacturer to ensure that the purchase order requirements of the item have been met. 4.4.2.3 If the item requiring inspection was not inspected at source, the item shall be inspected at the point of receiving, to verify conformance with purchase order requirements. 4.4.2.4 Items that conform to specified requirements shall be identified as such and either held in storage for later release or released and moved directly to their final location for installation or use. 4.4.2.5 Items that do not conform to specified requirements shall be identified as nonconforming, and segregated to prevent inadvertent installation or use.	See above.	

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	See above.	**N286.5-95** **4.4.3 Equipment Status Control** Operating staff shall know the status of systems and equipment under their control. The following requirements shall be addressed: a) Equipment status changes shall be approved, documented and communicated to the other operating staff. b) Deficient field equipment, instrumentation and control room indication shall be identified and not relied on until it has been restored to the operational state. c) The position of valves important to safety shall be known and controlled. d) Operating logs shall be used to record station activities and equipment status. e) Shift turnovers shall be held between the incoming and outgoing staff to transfer information on equipment status. f) The placement and removal of caution, warning, and other similar tags installed on station equipment shall be controlled. g) The status of maintenance, inspection, and tests shall be recorded and known. h) Procedures shall be implemented to control the installation, removal, and periodic review of temporary modifications. i) Operating staff shall be kept up-to-date on the status of temporary and permanent changes.	See above.	

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XV. NONCONFORMING MATERIALS, PARTS, OR COMPONENTS Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification to affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures.	**BASIC REQUIREMENT 15: CONTROL OF NONCONFORMING ITEMS** Items that do not conform to specified requirements shall be controlled to prevent inadvertent installation or use. Controls shall provide for identification, documentation, evaluation, segregation when practical, and disposition of nonconforming items, and for notification to affected organizations.	**N286.0-92** **13. Nonconformance** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.1-00** **3.11 Nonconformance** Non-conforming processes, practices, and documents shall be a) identified, documented, and reported; b) reviewed, resolved, verified, and the results documented; and c) controlled to prevent unauthorized use or implementation. **N286.2-00** **3.11 Nonconformance** 3.11.1 Non-conformance found during the design process shall be identified, documented, reported, and reviewed for disposition. **N286.3-99** **3.11 Nonconformance** 3.11.1 Measures shall be established to identify, report, review, and dispose of, control, and document items and services that do not conform to specified requirements. **N286.4-86** **7.1 Nonconformance** 7.1.1 Measures shall be established to identify, report, review, dispose, control, and document items, activities, and services that do not conform to requirements, in order to prevent their unauthorized use.	Both standards have similar requirements. Note that CSA N286.2-00 has a requirement to control nonconformances during the design process while ASME NQA-1-1994 limits its requirements to nonconforming items.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.5-95** **3.11 Nonconformance** Items, documents, services, and activities which do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.6-98** **3.11 Nonconformance** Items, documents, services, and activities that do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation.	See above.	
	SUPPLEMENT 15S-1 ***Supplementary Requirements for the Control of Nonconforming Items*** ***1. GENERAL*** *This Supplement provides amplified requirements for the control of nonconforming items. It supplements the requirements of Basic Requirement 15 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2. IDENTIFICATION *a) Identification of nonconforming items shall be by marking, tagging, or other methods which shall not adversely affect the end use of the item. The identification shall be legible and easily recognizable.* *b) If identification of each nonconforming item is not practical, the container, package, or segregated storage area, as appropriate, shall be identified.*	**N286.3-99** **3.11 Nonconformance** 3.11.4 Detected nonconforming items shall be suitably identified by marking, tagging, or other methods and segregated when practical. When segregation is impractical, other precautions shall be employed to preclude inadvertent use or installation.	As indicated above for ASME NQA-1-1994, Basic Requirement 15, the CSA N286 series of standards has **only** a general requirement to identify nonconforming items. However, only CSA N286.3-99 has a specific requirement regarding marking, tagging, or otherwise identifying nonconforming items.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	3. SEGREGATION *a) Nonconforming items shall be segregated, when practical, by placing them in a clearly identified and designated hold area until properly dispositioned.* *b) When segregation is impractical or impossible due to physical conditions such as size, weight, or access limitations, other precautions shall be employed to preclude inadvertent use of a nonconforming item.*	**N286.3-99** **3.11 Nonconformance** 3.11.4 Detected nonconforming items shall be suitably identified by marking, tagging, or other methods and segregated when practical. When segregation is impractical, other precautions shall be employed to preclude inadvertent use or installation.	As indicated above for ASME NQA-1-1994, Basic Requirement 15, the CSA N286 series of standards has **only** a general requirement to segregate nonconforming items. However, only CSA N286.3-99 has a specific requirement segregating nonconforming items.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	4. DISPOSITION ***4.1 Control*** *Nonconforming characteristics shall be reviewed and recommended dispositions of nonconforming items shall be proposed and approved in accordance with documented procedures. Further processing, delivery, installation, or use of a nonconforming item shall be controlled pending an evaluation and an approved disposition by authorized personnel.*	**N286.0-92** **13. Nonconformance** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.1-00** **3.11 Nonconformance** Non-conforming processes, practices, and documents shall be a) identified, documented, and reported; b) reviewed, resolved, verified, and the results documented; and c) controlled to prevent unauthorized use or implementation. **N286.3-99** **3.11 Nonconformance** 3.11.1 Measures shall be established to identify, report, review, and dispose of, control, and document items and services that do not conform to specified requirements. 3.11.6 Further processing, installation, or use of the nonconforming item or service shall be controlled pending an approved disposition. **N286.4-86** **7.1 Nonconformance** 7.1.1 Measures shall be established to identify, report, review, dispose, control, and document items, activities, and services that do not conform to requirements, in order to prevent their unauthorized use.	The CSA N286 series of standards has **only** a general requirement to evaluated and recommended dispositions of nonconforming items and to control their use. However, only CSA N286.3-99 has a specific requirement regarding further use of nonconforming items.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.4-86** **7.1 Nonconformance** 7.1.1 Measures shall be established to identify, report, review, dispose, control, and document items, activities, and services that do not conform to requirements, in order to prevent their unauthorized use. **N286.5-95** **3.11 Nonconformance** Items, documents, services, and activities which do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.6-98** **3.11 Nonconformance** Items, documents, services, and activities that do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation.	See above.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	4.2 Responsibility and Authority *The responsibility and authority for the evaluation and disposition of nonconforming items shall be defined.*	**N286.2-00** **3.11 Nonconformance** 3.11.2 The responsibilities for the disposition of non-conformances shall be identified.	The CSA N286 series of standards has **only** a generic requirement to define responsibilities and authorities. For example, CSA N286.0-92, Clause 5.1, states: The owner shall ensure that overall and second-tier measures are established to a) define and document the organizational structure, functional responsibilities, and levels of authority within organizational units; b) ensure that responsibilities of organizational units and assignments to individuals are effectively communicated; c) **identify the participants required to meet the CSA N286 Standards, and shall clearly establish and document their responsibilities;** d) identify the person(s) responsible for the implementation and effectiveness of the overall quality assurance program; e) ensure that the person(s) responsible for monitoring and assessing the effectiveness of the overall quality assurance program report to a management level such that the required authority and organizational freedom are provided. Such person(s) shall be independent of cost and schedule considerations; and f) ensure that the organizational structure and assignment of responsibility shall be such that persons performing, verifying, and auditing work are appropriately independent. An explicit requirement to identify responsibilities for the disposition of nonconformances is stated only in CSA N286.2-00.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	4.3 Personnel *Personnel performing evaluations to determine a disposition shall have demonstrated competence in the specific area they are evaluating, have an adequate understanding of the requirements, and have access to pertinent background information.*	**N286.0-92** **6. Personnel Capability** 6.1 The owner shall ensure that overall and second-tier measures are established which provide for personnel who are skilled and knowledgeable to perform the tasks assigned to them.	The CSA N286 series of standards has a generic requirement that personnel will be competent to do the assigned work.	No Significant Difference; No Impact on the ACR QA Program. The ACR Program covers this item adequately.

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	4.4 Disposition *The disposition, such as use-as-is, reject, repair, or rework, of nonconforming items shall be identified and documented.* *Technical justification for the acceptability of a nonconforming item, dispositioned repair, or use-as-is shall be documented.* *Nonconformances to design requirements dispositioned use-as-is or repair shall be subject to design control measures commensurate with those applied to the original design. The as-built records, if such records are required, shall reflect the accepted deviation.*	**N286.0-92** **13. Nonconformance** 13.1 The owner shall ensure that second-tier measures are established so that items, documents, services, and activities which do not conform to requirements are: a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.1-00** **3.11 Nonconformance** Non-conforming processes, practices, and documents shall be a) identified, documented, and reported; b) reviewed, resolved, verified, and the results documented; and c) controlled to prevent unauthorized use or implementation.	The CSA N286 series of standards has **only** generic requirements to control the disposition of nonconformances. However, the specific requirements listed in ASME NQA-1-1994, Basic Requirement 15, Supplement 15S-1, Clause 4.4 are not addressed explicitly.	No Significant Difference; No Impact on the ACR QA Program. The ACR Program covers this item adequately.

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	See above.	**N286.2-00** **3.11 Nonconformance** 3.11.1 Non-conformance found during the design process shall be identified, documented, reported, and reviewed for disposition. **N286.3-99** **3.11 Nonconformance** 3.11.1 Measures shall be established to identify, report, review, and dispose of, control, and document items and services that do not conform to specified requirements. **N286.4-86** **7.1 Nonconformance** 7.1.1 Measures shall be established to identify, report, review, dispose, control, and document items, activities, and services that do not conform to requirements, in order to prevent their unauthorized use. **N286.5-95** **3.11 Nonconformance** Items, documents, services, and activities which do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation. **N286.6-98** **3.11 Nonconformance** Items, documents, services, and activities that do not conform to requirements shall be a) identified, documented, and reported; b) reviewed and remedial actions determined, executed, verified, and recorded; and c) controlled to prevent unauthorized use or implementation.	See above.	

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	4.5 Repaired or Reworked Items *Repaired or reworked items shall be reexamined in accordance with applicable procedures and with the original acceptance criteria unless the nonconforming item disposition has established alternate acceptance criteria.*	**N286.3-99** **3.11 Nonconformance** 3.11.7 Repaired and reworked items shall be re-inspected in accordance with applicable procedures.	Only CSA N286.3-99 has a requirement similar to that in ASME NQA-1-1994.	Not applicable for the ACR Design Certification phase.
XVI. CORRECTIVE ACTION Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformance are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.	**BASIC REQUIREMENT 16: CORRECTIVE ACTION** Conditions adverse to quality shall be identified promptly and corrected as soon as practical. In the case of a significant condition adverse to quality, the cause of the condition shall be determined and corrective action taken to preclude recurrence. The identification, cause, and corrective action for significant conditions adverse to quality shall be documented and reported to appropriate levels of management; follow-up action shall be taken to verify implementation of this corrective action.	**N286.0-92** **14. Corrective Action** 14.1 The owner shall ensure that second-tier measures are established so that recurring or serious nonconforming conditions are: a) analyzed to determine their causes; and b) corrected to prevent recurrence. 14.2 Corrective action shall be documented and communicated to appropriate levels of management and monitored for effectiveness. 14.3 The owner shall ensure that second-tier responsibilities for the review of non-conformances, and their causes, and for developing acceptable dispositions are identified. **N286.1-00** **3.12 Corrective Action** 3.12.1 Significant conditions adverse to quality, which include recurring non-conformances, shall be: a) analyzed to determine their cause(s); and b) corrected to prevent recurrence. 3.12.2 Corrective action shall be documented and communicated to the appropriate level(s) of management and monitored for effectiveness. 3.12.3 Those with the responsibility for reviewing non-conformances and determining their cause(s), and developing actions to prevent recurrence, shall have access to all applicable information and shall be knowledgeable in root cause analysis.	Both standards have similar requirements. However, the CSA N286 series of standards does not have an explicit requirement to verify the completion of corrective actions. Unique NQA-1 requirements are: • Take follow-up action to verify implementation of this corrective action.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.2-00** **3.12 Corrective Action** 3.12.1 Recurring or serious nonconforming conditions shall be a) analyzed to determine their causes; b) corrected to prevent recurrence; and c) corrected within specified time limits. 3.12.2 Corrective action shall be documented and communicated to the appropriate levels of management and monitored for effectiveness. 3.12.3 The responsibilities for developing and implementing acceptable corrective actions shall be identified. **N286.3-99** **3.12 Corrective Action** 3.12.1 Recurring or serious deficiencies shall be a) analyzed to determine their causes; and b) corrected to prevent recurrence. 3.12.2 Corrective action shall be documented and communicated to appropriate levels of management are monitored for effectiveness. 3.12.3 Persons responsible for initiating and implementing corrective actions and performing follow-up reviews shall be identified.	See above.	

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	See above.	**N286.4-86** **7.2 Corrective Action** 7.2.1 Measures shall be established and documented to ensure that conditions adverse to quality are identified and corrected. 7.2.2 In the case, of significant conditions adverse to quality, the causes shall be determined and analyzed for trends, and corrective action shall be taken to prevent their repetition. The inputs to the corrective action process shall be identified. 7.2.3 Persons responsible for initiating and implementing corrective actions and performing follow-up reviews shall be identified. 7.2.4 The identification of a significant condition adverse to quality, its cause, and the corrective action taken shall be documented and reported to appropriate levels of management. **N286.5-95** **3.12 Corrective Action** 3.12.1 Recurring or serious deficiencies shall be: a) analyzed to determine their causes; and b) corrected to prevent recurrence. 3.12.2 Corrective action shall be documented and communicated to appropriate levels of management and monitored for effectiveness. 3.12.3 Responsibilities for the review of non-conformances and their causes, and for developing acceptable dispositions shall be identified.	See above	

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	See above.	**N286.6-98** **3.12 Corrective Action** 3.12.1 Significant events and recurring or serious deficiencies shall be a) analyzed to determine their causes; and b) corrected to prevent recurrence. 3.12.2 Corrective action shall be documented and communicated to appropriate levels of management and monitored for effectiveness. 3.12.3 Responsibilities for the review of non-conformances and their causes, and for developing acceptable dispositions, shall be identified.	See above.	

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XVII. QUALITY ASSURANCE RECORDS Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. The records shall also include closely-related data such as qualifications of personnel, procedures, and equipment. Inspection and test records shall, 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. Records shall be identifiable and retrievable. Consistent with applicable regulatory requirements, the applicant shall establish requirements concerning record retention, such as duration, location, and assigned responsibility.	**BASIC REQUIREMENT 17: QUALITY ASSURANCE RECORDS** Records that furnish documentary evidence of quality shall be specified, prepared, and maintained. Records shall be legible, identifiable, and retrievable. Records shall be protected against damage, deterioration, or loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition shall be established and documented.	**N286.0-92** **17. Records** The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.2-00** **3.15 Records** 3.15.1 Design records and design assurance records shall be maintained. Requirements for design records are given in Clause 5.10. Requirements for design assurance records are given in Clauses 3.15.2-3.15.5. **N286.3-99** **3.15. Records** 3.15.1.1 The owner and/or participant shall identify, control, and retain records that: a) are essential to provide evidence that items and services meet specified requirements; and b) the quality assurance program has been effectively implemented in accordance with this Standard. This shall include records required by applicable codes, standards, specifications, and regulations.	Note that ASME NQA-1-1994 does not reflect the fundamental requirement that quality assurance records shall include as a minimum those listed in 10CFR50 Appendix B, Section XVII. The CSA N286 series of standards uses the term "essential record". It defines this term as "all records essential to site selection, design, manufacture, construction and installation, commissioning, operation, and decommissioning of a nuclear power plant, including those records that are necessary to provide evidence that items, services, and activities meet specified requirements." On this basis essential records include quality assurance records. Both standards have similar requirements. However, the N286 series of standards does not have an explicit requirement for establishing and documenting requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition	No Significant Difference; No Impact on the ACR QA Program. Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.4-86** **8.2 Quality Assurance Records** 8.2.1 The owner shall identify, control, and retain the records that are essential to provide documented evidence that items and services meet specified requirements and that the commissioning quality assurance program has been effectively implemented in accordance with this Standard. This shall include records required by applicable codes, standards, specifications, and regulations. The owner shall establish and specify the records that are to be compiled during the commissioning phase of the plant life cycle. **N286.5-95** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.6-98** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. Essential records are the records essential to decommissioning, including those records that are necessary to provide evidence that items, services, and activities meet specified requirements.	See above.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	See above.	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the item and activity to which they refer. **N286.2-00** **3.15 Records** 3.15.3 Design assurance records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they apply. **N286.3-99** **3.15.2 Records System** 3.15.2.4 Each validated record shall be legible, indexed, and readily retrievable, and shall be traceable to the items and activities to which it refers. **N286.4-86** **8.2 Quality Assurance Records** 8.2.3 Each validated record shall be legible, readily retrievable, and traceable to the items and activities to which it refers. **N286.5-95** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they refer.	See above.	

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	See above.	**N286.6-98** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they refer.	See above.	
	See above.	**N286.0-92** **15. Change Control** 15.1 The owner shall ensure that second-tier measures are established so that a) permanent and temporary changes to accepted designs, items, processes, and practices are reviewed and approved before they are implemented; b) review and approval of changes to accepted designs, items, processes, and practices are made by persons who have full knowledge of the original intent and requirements; and c) changes are documented. **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled.	See above.	

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	See above.	**N286.1-00** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the item and activity to which they refer. **N286.2-00** **3.15 Records** 3.15.4 Design assurance records shall be maintained, stored, and inspected routinely to ensure their preservation and protection from loss, deterioration, and destruction. **5.9 Design Changes** 5.9.1 Procedures shall be established to identify and control changes to designs and associated documents after they have been approved. **5.10 Design Records** 5.10.3 Design records shall be complete, legible, retrievable, and traceable to their related items and activities.	See above.	

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	See above.	**N286.3-99** **3.14 Document Control** **3.14.1 The identification, review, approval, issue, distribution, and revision of all documents and software shall be controlled.** Document and software control measures shall provide for a) identifying individuals or organizations responsible for receiving or preparing, reviewing, approving, and issuing documents and revisions thereto; b) identifying the proper documents to be used in performing the activity; c) ascertaining that proper documents are being used; d) identifying obsolete documents as such and removing them promptly from areas where inadvertent use could affect quality; e) establishing current and updated distribution lists; f) coordinating and controlling interface documents; g) transferring documents to commissioning; and h) maintaining records that permit the identification of revisions. **3.15.2 Records System** 3.15.2.4 Each validated record shall be legible, indexed, and readily retrievable, and shall be traceable to the items and activities to which it refers.	See above.	

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	See above.	**N286.3-99** **3.15.3 Records Storage** 3.15.3.1 Measures shall be established and documented for the storage of essential records. The procedure shall include, as a minimum a) a description of the storage area; b) the filing system to be used; c) the rules governing access to and control of the files; d) a method for maintaining control of and accountability for records removed from the storage facility; e) a method for filing supplemental information and disposing of superseded records; and f) measures to maintain and routinely inspect the condition of the records so as to ensure their preservation and protection from loss, deterioration, or destruction. **N286.4-86** **8.2 Quality Assurance Records** 8.2.3 Each validated record shall be legible, readily retrievable, and traceable to the items and activities to which it refers. **8.3 Retention** 8.3.1 Measures shall be established to maintain, store, and routinely inspect the conditions of all essential records so as to ensure their preservation and protection from loss, deterioration, or destruction. **7.3 Change Control** 7.3.2 Such modifications shall be documented and included either in the original document or as an appendage thereto, and shall be shown promptly on all relevant documents being used by commissioning personnel.	See above.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	See above.	**N286.5-95** **3.13 Change Control** 3.13.1 Permanent and temporary changes to accepted designs, items, computer software, processes and practices shall be a) reviewed and approved before they are implemented; b) reviewed and approved by persons who have full knowledge of the original and current intent and requirements; and c) documented. **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. 3.15.1 Essential records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.6-98** **3.13 Change Control** 3.13.2 Changes to plans, items, processes, and practices shall be a) documented; and b) reviewed and approved before they are implemented by persons who have full knowledge of the original and current intent and requirements.	See above.	

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	SUPPLEMENT 17S-1 ***Supplementary Requirements for Quality Assurance Records*** ***1. GENERAL*** *This Supplement provides amplified requirements for quality assurance records. It supplements the requirements of Basic Requirement 1 7 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).* *The requirements of this Supplement apply to quality assurance records which have been completed.* *The term records, used throughout this Supplement, is to be interpreted as Quality Assurance Records.*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below
	2. RECORDS ADMINISTRATION ***2.1 Records System*** *A records system(s) shall be established by the organization responsible at the earliest practicable time consistent with the schedule for accomplishing work activities and in compliance with the general requirements of this Supplement. The records system(s) shall be defined, implemented, and enforced in accordance with written procedures, instructions, or other documentation.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.3-99** **3.15.2 Records System** 3.15.2.1 An essential records system shall be established on-site at the earliest practical time consistent with the schedule for accomplishing work activities. The essential records system shall be defined and implemented in accordance with written procedures, instructions, and other documentation.	CSA N286.1-00, CSA N286.2-00, CSA N286.4-86, CSA N286.5-95, and CSA N286.6-98 do not have an explicit requirement regarding the establishment and implementation of a records system. They do, however, specify some of the essential requirements that a records system must satisfy, such as retention requirements, records identification, maintenance, storage, routine inspection, etc.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	2.2 Generation of Records *The applicable design specifications, procurement documents, test procedures, operational procedures, or other documents shall specify the records to be generated, supplied, or maintained by or for the Owner. Documents that are designated to become records shall be legible, accurate, and completed appropriate to the work accomplished.*	**N286.1-00** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the item and activity to which they refer. **4.3 Preparation of Request to Bid** 4.3.2 Requests for bids, correspondence, or other communications with potential contractors shall include, but not be limited to, the following: a) scope of work; b) technical performance requirements; c) codes, standards, and specifications; d) jurisdictional and/or regulatory requirements; e) quality assurance program requirements; f) inspection, test, and acceptance requirements, including any special instructions; g) delivery requirements; h) documentation requirements and the timing of submittals; i) requirements for reporting and approving the disposition of non-conformances; j) right of access to the place of work, facilities, and records; k) provisions for extending applicable requirements to subcontractors, including owners' and participants' access to facilities and records; and l) provisions for controlled distribution, retention, maintenance, and disposition of quality assurance records. **N286.2-00** **3.15 Records** 3.15.2 Design assurance records shall be produced as required by the procedures used to manage and control design activities. 3.15.3 Design assurance records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they apply.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.3 Record Validation *Documents shall be considered valid records only if stamped, initialled, or signed and dated by authorized personnel or otherwise authenticated. This authentication may take the form of a statement by the responsible individual or organization. Handwritten signatures are not required if the document is clearly identified as a statement by the reporting individual or organization. These records may be originals or reproduced copies.*		The N286 series of standards does not have a detailed set of criteria to validate a quality assurance record as specified in ASME NQA-1-1994, Basic Requirement 17S-1, Clause 2.3	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	2.4 Index *The records shall be indexed. The indexing system(s) shall include, as a minimum, record retention times and the location of the record within the record system.*	**N286.0-92** **17 Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer.	The N286series of standards specifies **only** general requirements for a records management system. However, the N286 series of standards does not prescribe explicitly a requirement for a records indexing system.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	2.5 Distribution *The records shall be distributed, handled, and controlled in accordance with written procedures.*	**N286.0-92** **16. Document Control** 16.1 The owner shall ensure overall and second-tier measures are established so that a) essential documents and their use are identified; b) preparation, review, approval, issue, and revision of documents are controlled; c) current documents are available to the users; and d) obsolete documents are not used. **N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled. **N286.2-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.6 Identification *Records and/or indexing system(s) shall provide sufficient information to permit identification between the record and the item(s) or activity(ies) to which it applies.*	**N286.0-92** **17 Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the item and activity to which they refer. **N286.2-00** **3.15 Records** 3.15.3 Design assurance records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they apply.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.7 Classification *Records shall be classified as Lifetime or Nonpermanent by the Owner, or his agent when authorized, in accordance with the criteria given in paras. 2.7.1 and 2.7.2 below.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** **3.15.3 Two categories of essential records shall be established: permanent and non-permanent.** **N286.2-00** **5.10 Design Records** 5.10.6 The design organization shall supply to the owner, or to the design organization's client for submission to the owner, those design records that are identified by the owner as permanent records. Permanent records are those that meet one or more of the following criteria: a) those of value in establishing and demonstrating capability for safe operation; b) **those required to maintain, rework, repair, replace, or modify a system, component, or structure;** c) those of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) those required to provide baseline data for periodic inspection; and e) those of value in decommissioning a system, component, or structure.	Both standards have similar requirements for all life cycle phases except decommissioning. For decommissioning the concept of permanent and non-permanent records does not seem appropriate. However, CSA N286.6-98 provides requirements for "End-State Documentation" in clause 4.2.5 (see below).	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.3-99** **3.15 Records** 3.15.1.2 Two categories of essential records shall be established: permanent and nonpermanent. **N286.4-86** **8.2 Quality Assurance Records** 8.2.4 Two categories of essential records shall be established: permanent and nonpermanent. **N286.5-95** **3.15 Records** 3.15.3 Essential records shall be designated either permanent or nonpermanent.	See above.	

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	2.7.1 ***Lifetime Records****. Lifetime records are those that meet one or more of the following criteria:* *a) those which would be of significant value in demonstrating capability for safe operation;* *b) those which would be of significant value in maintaining, reworking, repairing, replacing, or modifying an item;* *c) those which would be of significant value in determining the cause of an accident or malfunction of an item;* *d) those which provide required baseline data for in-service inspections.* *Lifetime records are required to be maintained by or for the plant owner for the life of the particular item while it is installed in the plant or stored for future use.*	**N286.1-00** **3.15 Records** 3.15.4 Records that meet one or more of the following criteria shall be classified as permanent: a) of value in demonstrating capability for safe operation; b) required to maintain, repair, replace, or modify an item; c) of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) required to provide baseline data for periodic inspection; or e) of value in decommissioning an item. **N286.2-00** **5.10 Design Records** 5.10.6 The design organization shall supply to the owner, or to the design organization's client for submission to the owner, those design records that are identified by the owner as permanent records. Permanent records are those that meet one or more of the following criteria: a) those of value in establishing and demonstrating capability for safe operation; b) **those required to maintain, rework, repair, replace, or modify a system, component, or structure;** c) those of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) those required to provide baseline data for periodic inspection; and e) those of value in decommissioning a system, component, or structure.	Both standards have similar requirements regarding the characteristics of permanent records. However, unlike ASME NQA-1-1994 the CSA N286 series of standards includes as a characteristic any document that would be of value in decommissioning an item. Also, CSA N286.6-98 specifies requirements for "end-state documentation".	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.3-99** **3.15 Records** 3.15.1.3 Records designated as permanent shall be maintained by or for the owner for the life of the plant or at least for the life of the particular item concerned. Permanent records are those which meet one or more of the following criteria: a) those which would be of value in demonstrating capability for safe operation; b) those which would be required to maintain, rework, repair, replace, or modify an item; c) those which would be of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) those required to provide baseline data for periodic inspection; and e) those which would be of value in decommissioning an item. **N286.4-86** **8.2 Quality Assurance Records** 8.2.5 Records designated permanent shall be maintained by, or for, the owner for the operational life of the plant or at least for the life of the particular item concerned. Permanent records are those which meet one or more of the following criteria: (a) those which would be of value in demonstrating capability for safe operation; (b) those which would be required to maintain, rework, repair, replace, or modify an item; (c) those which would be of value in determining the cause of an accident, malfunction, or unscheduled occurrence; (d) those required to provide baseline data for periodic inspection; and (e) those which would be of value in decommissioning an item.	See above.	

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	See above.	**N286.5-95** **3.15 Records** 3.15.4 Records that meet one or more of the following criteria shall be designated as permanent records: a) those that would be of value in demonstrating capability for safe operation; b) those that would be required to maintain, repair, replace, or modify an item; c) those that would be of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) those required to provide baseline data for periodic inspection; or e) those that would be of value in decommissioning an item. **N286.6-98** **4.2.5 End-State Documentation** At the end of each decommissioning stage, detailed documentation shall be produced to describe the decommissioning activities that have taken place and the physical condition of the plant at the end of the decommissioning stage. The end-state documentation shall include a) a detailed description of the systems, structures, and components remaining at the end of the decommissioning stage, including reference to appropriate engineering drawings, photographs, diagrams, etc; b) the amounts of radioactive and non-radioactive materials removed and their disposition; and c) an assessment of the remaining radiological and non-radiological hazards. If the decommissioning stage is the final stage in the decommissioning of the nuclear power plant, appropriate information shall be placed on public records (e.g., land registry records).	See above.	

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	See above.	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15 Permanent records shall be kept for the life of the item (which is usually the life of the plant). **N286.2-00** **5.10 Design Records** 5.10.7 Permanent records shall be maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.3-99** **3.15 Records** 3.15.1.3 Records designated as permanent shall be maintained by or for the owner for the life of the plant or at least for the life of the particular item concerned. Permanent records are those which meet one or more of the following criteria: a) those which would be of value in demonstrating capability for safe operation; b) those which would be required to maintain, rework, repair, replace, or modify an item; c) those which would be of value in determining the cause of an accident, malfunction, or unscheduled occurrence; d) those required to provide baseline data for periodic inspection; and e) those which would be of value in decommissioning an item.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.4-86** **8.2 Quality Assurance Records** 8.2.5 Records designated permanent shall be maintained by, or for, the owner for the operational life of the plant or at least for the life of the particular item concerned. Permanent records are those which meet one or more of the following criteria: (a) those which would be of value in demonstrating capability for safe operation; (b) those which would be required to maintain, rework, repair, replace, or modify an item; (c) those which would be of value in determining the cause of an accident, malfunction, or unscheduled occurrence; (d) those required to provide baseline data for periodic inspection; and (e) those which would be of value in decommissioning an item. **N286.5-95** **3.15 Records** 3.15.5 Permanent records shall be maintained for the life of the plant or at least for the life of the particular item concerned.	See above.	

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	*2.7.2 **Nonpermanent Records**.* *Nonpermanent records are those required to show evidence that an activity was performed in accordance with the applicable requirements but need not be retained for the life of the item because they do not meet the criteria for lifetime records.*	**N286.1-00** **3.15 Records** 3.15.6 Records that are required to show evidence that an activity was performed according to requirements and that do not meet the criteria for permanent records shall be classified as non-permanent records. **N286.2-00** **3.15 Records** 3.15.2 Design assurance records shall be produced as required by the procedures used to manage and control design activities. 3.15.5 Design assurance records shall be retained until the assigned work is complete and accepted by the client. **N286.3-99** **3.15 Records** 3.15.1.4 Records shall be designated as nonpermanent when they are not needed to satisfy the requirements of permanent records, but are necessary as evidence that an activity was performed according to requirements. **N286.4-86** **8.2 Quality Assurance Records** 8.2.6 Records shall be designated nonpermanent when they are not needed to satisfy the requirements for permanent records, but where they are necessary to show evidence that an activity was performed according to requirements. **N286.5-95** **3.15 Records** 3.15.2 Essential records shall be complete, valid, legible, retrievable, and traceable to the items and activities to which they refer. 3.15.6 Minimum retention periods for nonpermanent records shall be defined.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	2.8 Retention of Records *Records shall be retained in accordance with the above classifications. The retention period for nonpermanent records shall be established in writing.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** **3.15.7 Retention periods shall be established for non-permanent records.** **N286.2-00** **3.15 Records** 3.15.5 Design assurance records shall be retained until the assigned work is complete and accepted by the client. **5.10 Design Records** 5.10.8 Minimum retention periods for nonpermanent records shall be defined. **N286.3-99** **3.15.2 Records System** 3.15.2.2 The on-site individual responsible for essential records shall be identified. The individual shall collect, file, store, maintain, and dispose of essential records for the owner in accordance with this Standard. 3.15.2.3 Procedures shall be implemented for the receipt, validation, and registration of incoming records to ensure that the records received are a) in agreement with the transmittal documents; b) in good condition; and c) complete at the end of the construction phase.	Both standards have similar requirements regarding non-permanent record retention.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.3-99** **3.15.4 Records Retention** 3.15.4.2 Minimum retention periods for nonpermanent records shall be defined. Nonpermanent records shall be retained for at least the minimum period specified by the owner. The minimum retention period shall meet the requirements of the applicable codes, standards, and regulatory requirements. **N286.4-86** **8.2 Quality Assurance Records** 8.3.2 Non-permanent records shall be retained for at least the minimum period specified by the owner. The minimum retention period shall meet the requirements of the applicable codes, standards, and regulatory requirements. **N286.5-95** **3.15 Records** 3.15.6 Minimum retention periods for nonpermanent records shall be defined.	See above.	

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	2.9 Corrected Information in Records *Records may be corrected in accordance with procedures which provide for appropriate review or approval by the originating organization. The correction shall include the date and the identification of the person authorized to issue such correction.*	**N286.0-92** **16 Document Control** 16.1 The owner shall ensure overall and second-tier measures are established so that a) essential documents and their use are identified; b) preparation, review, approval, issue, and revision of documents are controlled; c) current documents are available to the users; and d) obsolete documents are not used. **N286.1-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents (including software and other machine-read information) shall be controlled. 3.14.2 Revisions to documents shall be identified. **N286.2-00** **3.14 Document Control** 3.14.1 The identification, review, approval, issue, distribution, and revision of documents and analytical tools shall be controlled. See Clauses 5.8 and 5.9 for the detailed requirements. 3.14.2 Information that identifies changes and revisions to documents or analytical tools shall be maintained.	The N286 series of standards has **only** general requirements for controlling changes to documents. However, the N286 series of standards does not have a specific requirement for correcting quality assurance records including the identification of the date and the person authorized to issue such corrections.	No Significant Difference; No Impact on the ACR QA Program.

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	3. RECEIPT ***3.1 Responsibility*** *The individual or organization responsible for receiving records shall provide protection from damage or loss during the time that the records are in their possession.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.2-00** **3.15 Records** 3.15.4 Design assurance records shall be maintained, stored, and inspected routinely to ensure their preservation and protection from loss, deterioration, and destruction. **N286.3-99** **3.15.3 Records Storage** 3.15.3.1 Measures shall be established and documented for the storage of essential records. The procedure shall include, as a minimum a) a description of the storage area; b) the filing system to be used; c) the rules governing access to and control of the files; d) a method for maintaining control of and accountability for records removed from the storage facility; e) a method for filing supplemental information and disposing of superseded records; and f) measures to maintain and routinely inspect the condition of the records so as to ensure their preservation and protection from loss, deterioration, or destruction.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.

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	See above.	**N286.3-99** **8.3 Retention** 8.3.1 Measures shall be established to maintain, store, and routinely inspect the conditions of all essential records so as to ensure their preservation and protection from loss, deterioration, or destruction. **N286.5-95** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction.	See above.	
	3.2 Receipt Control *Each organization responsible for the receipt of records shall designate a person or organization responsible for receiving the records. The designee shall be responsible for organizing and implementing a system of receipt control of records for permanent and temporary storage. As a minimum, a receipt control system shall include the following:* *a) a method for designating the required records;* *b) a method for identifying records received;* *c) procedures for receipt and inspection of incoming records;* *d) a method for submittal of completed records to the storage facility without unnecessary delay.*	**N286.3-99** **3.15.2 Records System** 3.15.2.2 The on-site individual responsible for essential records shall be identified. The individual shall collect, file, store, maintain, and dispose of essential records for the owner in accordance with this Standard. 3.15.2.3 Procedures shall be implemented for the receipt, validation, and registration of incoming records to ensure that the records received are a) in agreement with the transmittal documents; b) in good condition; and c) complete at the end of the construction phase.	Only CSA N286.3-99 addresses the ASME NQA-1-1994 requirements for designating a person or organization responsible for receiving records and for organizing and implementing a system of receipt control of records for permanent and temporary storage.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	3.3 Status *Each receipt control system shall be structured to permit a current and accurate assessment of the status of records during the receiving process.*		The N286 series of standards does not have a requirement for the receipt control system to be structured to permit a current and accurate assessment of the status of records during the receiving process.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	STORAGE, PRESERVATION, AND SAFEKEEPING ***4.1 Storage*** *The records shall be stored in predetermined location(s) that meet the requirements of applicable standards, codes, and regulatory agencies.* *Prior to storage of records, a written storage procedure shall be prepared and responsibility assigned for enforcing the requirements of that procedure. This procedure shall include, as a minimum, (a) through (g) below:* *a) a description of the storage facility;* *b) the filing system to be used;* *c) a method for verifying that the records received are in agreement with the transmittal document and that the records are legible;* *d) a method of verifying that the records are those designated (see para. 3.2 above);* *e) the rules governing access to and control of the files;* *f) a method for maintaining control of and accountability for records removed from the storage facility;* *g) a method for filing supplemental information (see para. 2.9 above) and disposing of superseded records.*	**N286.3-99** **3.15.3 Records Storage** 3.15.3.1 Measures shall be established and documented for the storage of essential records. The procedure shall include, as a minimum a) a description of the storage area; b) the filing system to be used; c) the rules governing access to and control of the files; d) a method for maintaining control of and accountability for records removed from the storage facility; e) a method for filing supplemental information and disposing of superseded records; and f) measures to maintain and routinely inspect the condition of the records so as to ensure their preservation and protection from loss, deterioration, or destruction.	The N286 series of standards does not specify such detailed requirements for a storage procedure. Only CSA N286.3-99 specifies some, but not all, the requirements specified in ASME NQA-1-1994, Basic Requirement 17, Supplement 17S-1, Clause 4.1.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

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	4.2 Preservation *Records shall be stored in a manner approved by the organization or organizations responsible for storage. In order to preclude deterioration of the records, the requirements of (a) through (c) below shall apply.* *a) Provisions shall be made in the storage arrangement to prevent damage from moisture, temperature, and pressure.* *b) Records shall be firmly attached in binders or placed in folders or envelopes for storage in steel file cabinets or on shelving in containers.* *c) Provisions shall be made for special processed records (such as radiographs, photographs, negatives, microform, and magnetic media) to prevent damage from excessive light, stacking, electromagnetic fields, temperature, and humidity.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.2-00** **3.15 Records** 3.15.4 Design assurance records shall be maintained, stored, and inspected routinely to ensure their preservation and protection from loss, deterioration, and destruction. **N286.3-99** **3.15.3 Records Storage** 3.15.3.1 Measures shall be established and documented for the storage of essential records. The procedure shall include, as a minimum a) a description of the storage area; b) the filing system to be used; c) the rules governing access to and control of the files; d) a method for maintaining control of and accountability for records removed from the storage facility; e) a method for filing supplemental information and disposing of superseded records; and f) measures to maintain and routinely inspect the condition of the records so as to ensure their preservation and protection from loss, deterioration, or destruction.	The N286 series of standards has **only** a general requirement for the maintenance of records and their protection from loss, deterioration, or destruction. However, the N286 series of standards does not have specific requirements for records to be protected from moisture, temperature, pressure, to be filed in binders or folders and for specially processed records to be protected from damage.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	See above.	**N286.3-99** **8.3 Retention** 8.3.1 Measures shall be established to maintain, store, and routinely inspect the conditions of all essential records so as to ensure their preservation and protection from loss, deterioration, or destruction. **N286.5-95** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction.	See above.	
	4.3 Safekeeping *Measures shall be established to preclude the entry of unauthorized personnel into the storage area. These measures shall guard against larceny and vandalism.* *Measures shall be taken to provide for replacement, restoration, or substitution of lost or damaged records.*		The N286 series of standards does not have explicit requirements regarding prevention of larceny and vandalism, and the replacement, restoration or substitution of lost or damaged quality assurance records.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

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	4.4 Storage Facilities *Records shall be stored in facilities constructed and maintained in a manner which minimizes the risk of damage or destruction from the following:* *a) natural disasters such as winds, floods, or fires;* *b) environmental conditions such as high and low temperatures and humidity;* *c) infestation of insects, mould, or rodents.* *There are two satisfactory methods of providing storage facilities, single or dual.*	**N286.0-92** **17. Records** 17.1 The owner shall ensure that overall and second-tier measures are established to a) identify essential records; b) identify records' retention requirements; c) ensure essential records are maintained and secured for the required retention period; and d) ensure essential records are valid, legible, retrievable, and traceable to the items and activities to which they refer. **N286.1-00** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction. **N286.2-00** **3.15 Records** 3.15.4 Design assurance records shall be maintained, stored, and inspected routinely to ensure their preservation and protection from loss, deterioration, and destruction.	The CSA N286 series of standards specifies **only** the basic requirement that records be stored in such a way as to protect them from loss, deterioration, or destruction. However, the CSA N286 series of standards, with the exception of CSA N286.3-99, does not specify specific requirements for storage facilities listed in ASME NQA-1-1994. The CSA N286 series of standards also does not specify the option of providing dual storage facilities, except in CSA N286.3-99.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

10CFR50 App. B	ASME NQA-1-1994	CSA N286	Differences	Assessment of Differences For ACR QA Program
	See above.	**N286.3-99** **3.15.3 Records Storage** 3.15.3.1 Measures shall be established and documented for the storage of essential records. The procedure shall include, as a minimum a) a description of the storage area; b) the filing system to be used; c) the rules governing access to and control of the files; d) a method for maintaining control of and accountability for records removed from the storage facility; e) a method for filing supplemental information and disposing of superseded records; and f) measures to maintain and routinely inspect the condition of the records so as to ensure their preservation and protection from loss, deterioration, or destruction. 3.15.3.3 A satisfactory alternative to the establishment of a record storage facility is storage of a duplicate of records in a separate remote location that meets the requirements of Clause 3.15.2. **N286.4-86** **8.3 Retention** 8.3.1 Measures shall be established to maintain, store, and routinely inspect the conditions of all essential records so as to ensure their preservation and protection from loss, deterioration, or destruction. **N286.5-95** **3.15 Records** 3.15.1 Essential records shall be identified, maintained, stored, and routinely inspected to ensure their preservation and protection from loss, deterioration, or destruction.	See above.	

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	4.4.1 Single Storage Facility. *Design and construction of a single record storage facility shall meet the criteria of (a) through (i) below:* *a) reinforced concrete, concrete block, masonry, or equal construction;* *b) floor and roof with drainage control. If a floor drain is provided, a check valve (or equal) shall be included.* *c) doors, structure and frames, and hardware shall be designed to comply with the requirements of a minimum 2 hr fire rating;* *d) sealant applied over walls as a moisture or condensation barrier;* *e) surface sealant on floor providing a hard wear surface to minimize concrete dusting;* *f) foundation sealant and provisions for drainage;* *g) forced air circulation with filter system;* *h) fire protection system;* *i) only those penetrations used exclusively for fire protection, communication, lighting, or temperature/ humidity control are allowed; all such penetrations shall be sealed or dampered to comply with the minimum 2 hr fire protection rating.* *The construction details shall be reviewed for adequacy of protection of contents by a person who is competent in the technical field of fire protection and fire extinguishing.* *If the storage facility is located within a building or structure, the environment and construction of that building can provide a portion or all of these criteria.*		The N286 series of standards does not provide detailed requirements for acceptable records storage facilities.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

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	4.4.2 Alternate Single Storage Facility. *The following are acceptable alternatives to the criteria of para. 4.4.1 above for a single storage facility:* *a) 2 hr fire rated vault meeting NFPA 232-1986 or NFPA 232AM-1 986, or both;*[2] *b) 2 hr fire rated Class B file containers meeting the requirements of NFPA 232-1986 or NFPA 232AM-1 986, or both; or* *c) 2 hr fire rated file room meeting the requirements of NFPA 232-1986 or NFPA 232AM-1 986, or both*[1] *with the following additional provisions:* *1) early warning fire detection and automatic fire suppression capability with electronic supervision at a constantly attended central station;* *2) records storage in fully enclosed metal cabinets;* *3) adequate access and aisle ways;* *4) prohibition in the room of work not directly associated with record storage or retrieval;* *5) prohibition in the room of smoking, eating, or drinking;* *6) 2 hr fire rated dampers or doors in all boundary penetrations.*		The N286 series of standards does not provide detailed requirements for acceptable records storage facilities.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

[2] NFPA 232-1986 and NFPA 232AM-1986 are published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269l.

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	*4.4.3 **Temporary Storage.** When temporary storage of records (such as for processing, review, or use) is required by an organization's procedures, the records shall be stored in a 1 hr fire rated container. The procedures shall specify the maximum allowable time limit for temporary storage. The container shall bear a UL label (or equivalent) certifying 1 hr fire protection or be certified by a person competent in the technical field of fire protection.*		The N286 series of standards does not provide detailed requirements for acceptable temporary records storage facilities.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.
	*4.4.4 **Dual Storage Facilities**. If dual storage facilities for each record are provided, the storage facilities shall be at locations sufficiently remote from each other to eliminate the chance of exposure to a simultaneous hazard. Each storage facility is not required to satisfy the requirements of para. 4.4.1, para. 4.4.2 or para. 4.4.3 above, but shall meet the other requirements of this Part (Part I).*	**N286.3-99** **3.15.3 Records** Storage 3.15.3.3 A satisfactory alternative to the establishment of a record storage facility is storage of a duplicate of records in a separate remote location that meets the requirements of Clause 3.15.2.	The CSA N286 series of standards, with the exception of CSA N286.3-99, also does not specify the option of providing dual storage facilities.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	5. RETRIEVAL *Storage systems shall provide for retrieval of information in accordance with planned retrieval times based upon the record type.* *A list shall be maintained designating those personnel who shall have access to the files.* *Records maintained by a Supplier at his facility or other location shall be accessible to the Purchaser or his designated alternate, e.g., the Owner.*		The CSA N286 series of standards does not specify such detailed requirements for retrieval of information from quality assurance records storage systems.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	6. DISPOSITION *Records accumulated at various locations, prior to transfer, shall be made accessible to the Owner directly or through the procuring organization. The custodian shall inventory the submittals, acknowledge receipt, and process these records in accordance with this Part (Part I).* *Various regulatory agencies have requirements concerning records that are within the scope of this Part (Part I). The most stringent requirements shall be used in determining the final disposition.* *The Supplier's nonpermanent records shall not be disposed of until the applicable conditions listed in (a) through (e) below are satisfied:* *a) items are released for shipment, a Code Data Report is signed, or a Code Symbol Stamp is affixed;* *b) regulatory requirements are satisfied;* *c) operational status permits;* *d) warranty consideration is satisfied;* *e) Purchaser's requirements are satisfied.*		The CSA N286 series of standards does not have such detailed requirements regarding the disposition of non-permanent quality assurance records.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures. 10CFR50 Appendix B requirements are met.

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XVIII. AUDITS A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The audits shall be performed in accordance with the written procedures or check lists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results shall be documented and reviewed by management having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be taken where indicated.	**BASIC REQUIREMENT 18: AUDITS** Planned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness. These audits shall be performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing the activities being audited. Audit results shall be documented and reported to and reviewed by responsible management. Follow-up action shall be taken where indicated.	**N286.0-92** **18.2 Audit** The owner shall ensure that audit programs meet the following requirements: a) Audits shall be conducted in accordance with approved procedures to confirm that the quality assurance program has been established and implemented effectively. b) Audits shall be carried out at a frequency sufficient to confirm continuing conformance with requirements. c) Audit scope and timing shall be appropriate to the status and duration of the phase being audited. d) Audits shall include i. the overall program; ii. second-tier programs including participants' programs; and iii. interfaces between programs. e) Audits shall be carried out by personnel who neither performed nor verified activities being audited. f) Audit results shall be documented, and then reported to and assessed by a level of management having sufficient breadth of responsibility to ensure that action is taken to address audit findings.	Both standards have similar requirements.	No Significant Difference; No Impact on the ACR QA Program.
	SUPPLEMENT 18S-1 ***Supplementary Requirements for Audits*** ***1. GENERAL*** *This Supplement provides amplified requirements for quality assurance audits. It supplements the audit requirements of Basic Requirement 18 of this Part (Part I) and shall be used in conjunction with that Basic Requirement when and to the extent specified by the organization invoking this Part (Part I).*		This NQA-1-1994 clause is a paragraph introducing the additional requirements in the Supplementary Requirements. It specifies only that the Supplementary Requirements apply when and to the extent specified by the organization invoking Part I of NQA-1-1994.	See below

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	2. SCHEDULING *Internal or external quality assurance audits, or both, shall be scheduled in a manner to provide coverage and coordination with ongoing quality assurance program activities. Audits shall be scheduled at a frequency commensurate with the status and importance of the activity. The audit schedule shall be reviewed periodically and revised as necessary to assure that coverage is maintained current. Regularly scheduled audits shall be supplemented by additional audits of specific subjects when necessary to provide adequate coverage.*	**N286.2-00** **3.16.2 Independent Assessment** 3.16.2.3 The assessment frequency shall be sufficient to confirm that requirements continue to be met. **N286.3-99** **3.16.2 Audits** 3.16.2.10 Audits shall be carried out at regular intervals and with sufficient frequency to confirm conformance with the program. Scheduled audits shall be supplemented by additional audits when the effectiveness of the program is in doubt. Audit scope and timing shall take into consideration the maturity of the quality assurance program and the execution status and duration of the construction phase. **N286.4-86** **6. Audit Function** 6.4 Audits shall be conducted with sufficient frequency to confirm conformance to the commissioning quality assurance program. The scope and timing of audits shall recognize the status and duration of the commissioning program. **N286.5-95** **3.16.2 Independent Assessments** 3.16.2.3 The assessment frequency shall be sufficient to confirm that all requirements continue to be met. **N286.6-98** **3.16.2 Independent Assessment** 3.16.2.2 The assessment frequency shall be sufficient to confirm that all requirements continue to be met.	The CSA N286 series of standards exhibits a certain degree of inconsistencies in its requirements. CSA N286.1-00 does not have an explicit requirement that audits be conducted with sufficient frequency to confirm effective implementation of the quality assurance program. CSA N286.1-00, CSA N286.2-00, CSA N286.4-86, CSA N286.5-95 and CSA N286.6-98 do not call for supplementary audits when necessary. The CSA N286 series of standards focuses on the requirements of internal audits. External audits arise only in the context of procurement and are addressed in CSA N286.1-00, Clause 4.5.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	3. PREPARATION ***3.1 Audit Plan*** *The auditing organization shall develop and document an audit plan for each audit. This plan shall identify the audit scope, requirements, audit personnel, activities to be audited, organizations to be notified, applicable documents, schedule, and written procedures or checklists.*	**CSA N286.3-99** **3.16.2 Audits** 3.16.2.3 Auditors shall identify the audit scope and objective, the requirements of the applicable documents, the activities to be audited, and the organizations to be notified.	With the exception of CSA N286.3-99, the CSA N286 series of standards does not have an explicit requirement to prepare audit plans.	See above

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	3.2 Personnel *The auditing organization shall select and assign auditors who are independent of any direct responsibility for performance of the activities which they will audit. In the case of internal audits, personnel having direct responsibility for performing the activities being audited shall not be involved in the selection of the audit team. Audit personnel shall have sufficient authority and organizational freedom to make the audit process meaningful and effective.*	**N286.1-00** **3.16 Program Assessment** 3.16.3 Individuals responsible for assessment of the procurement quality assurance program shall have sufficient authority to ensure that an effective assessment is performed. **N286.2-00** **3.16.2 Independent Assessment** 3.16.2. 4 The person(s) responsible for independently assessing the design quality assurance program shall a) have access to personnel, work activities, documents, and records as necessary to assess the program; b) be independent of cost and schedule considerations; and c) have neither performed nor verified the activities being assessed. **N286.5-95** **3.16.2 Independent Assessment** 3.16.2.4 The person(s) responsible for independently assessing the effectiveness of the quality assurance program shall a) have access to the plant, personnel, work activities, documents and records as necessary to assess the program; b) be independent of cost and schedule considerations; and c) have neither performed nor verified the activities being assessed. **N286.6-98** **3.16.2 Independent Assessment** 3.16.2.3 The person(s) responsible for independently assessing the effectiveness of the quality assurance program shall a) have access to the plant, personnel, work activities, documents, and records as necessary to assess the program; b) be independent of cost and schedule considerations; arid c) have neither performed nor verified the activities being assessed.	The CSA N286 series of standards exhibits a certain degree of inconsistencies in its requirements. CSA N286.0-92, CSA N286.3-99, and CSA N286.4-86 do not have a specific requirement regarding auditors' authority.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	3.3 Selection of Audit Team *An audit team shall be identified prior to the beginning of each audit. This team shall contain one or more auditors and shall have an individual appointed to lead the team who organizes and directs the audit, coordinates the preparation and issuance of the audit report, and evaluates responses. The audit team leader shall ensure that the audit team is prepared prior to initiation of the audit.*		The CSA N286 series of standards does not specify a requirement regarding the structure of the audit team.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	4. PERFORMANCE *Audits shall be performed in accordance with written procedures or checklists. Auditing shall begin as early in the life of the activity as practical and shall be continued at intervals consistent with the schedule for accomplishing the activity. Elements that have been selected for audit shall be evaluated against specified requirements. Objective evidence shall be examined to the depth necessary to determine if these elements are being implemented effectively. Audit results shall be documented by auditing personnel and shall be reviewed by management having responsibility for the area audited. Conditions requiring prompt corrective action shall be reported immediately to management of the audited organization.*		The CSA N286 series of standards does not specify a detailed requirement regarding the performance of audits.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	5. REPORTING *The audit report shall be signed by the audit team leader and issued, and it shall include the following information, as appropriate:* *a) description of the audit scope;* *b) identification of the auditors;* *c) identification of persons contacted during audit activities;* *d) summary of audit results, including a statement on the effectiveness of the quality assurance program elements which were audited;* *e) description of each reported adverse audit finding in sufficient detail to enable corrective action to be taken by the audited organization.*	**N286.1-00** **3.16 Program Assessments** 3.16.5 Assessment results shall be reported to a level of management having sufficient authority to resolve all identified problems. **N286.2-00** **3.16.2 Independent Assessment** 3.16.2.5 The results of independent assessments shall be reported to a level of management having the authority to resolve any identified problems. **N286.3-99** **3.16.2 Audits** 3.16.2.4 Upon completion of the audit, the auditors shall a) promptly report any deficiencies revealed by the audit to the appropriate level of management; and b) subsequently confirm that measures were taken to remedy the deficiency(is), and corrective action has been taken where appropriate. **N286.4-86** **6. Audit Function** 6.6 Auditors shall bring to the attention of the appropriate level of management the deficiencies revealed by their audits, and shall subsequently confirm that (a) measures have been taken to remedy such deficiencies; and (b) corrective actions have been taken where appropriate. **N286.5-95** **3.16.2 Independent Assessments** 3.16.2.5 The results of independent assessments shall be documented and reported to a level of management having sufficient breadth of responsibility to resolve any identified problems.	The CSA N286 series of standards specifies **only** the general requirement that audit results shall be documented. However, the CSA N286 series of standards does not specify the detailed requirements of audit report content.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	See above.	**N286.6-98** **3.16.2 Independent Assessment** 3.16.2.4 The results of independent assessments shall be documented and reported to a level of management having sufficient breadth of responsibility to resolve any identified problems.	See above.	
	6. RESPONSE *Management of the audited organization or activity shall investigate adverse audit findings, schedule corrective action, including measures to prevent recurrence, and notify the appropriate organization in writing of action taken or planned. The adequacy of audit responses shall be evaluated by or for the auditing organization.*	**N286.1-00** **3.16 Program Assessments** 3.16.5 Assessment results shall be reported to a level of management having sufficient authority to resolve all identified problems. **N286.2-00** **3.16.2 Independent Assessment** 3.16.2.5 The results of independent assessments shall be reported to a level of management having the authority to resolve any identified problems. **N286.3-99** **3.16.2 Audits** 3.16.2.6 The audited organization shall schedule corrective actions and reply in writing, stating the actions taken and the date they were completed. **N286.5-95** **3.16.2 Independent Assessments** 3.16.2.5 The results of independent assessments shall be documented and reported to a level of management having sufficient breadth of responsibility to resolve any identified problems. **N286.6-98** **3.16.2 Independent Assessment** 3.16.2.4 The results of independent assessments shall be documented and reported to a level of management having sufficient breadth of responsibility to resolve any identified problems.	The CSA N286 series of standards exhibits a certain degree of inconsistencies in its requirements. CSA N286.4-86 does not specify any requirements regarding audited management's response to the audit. CSA N286.3-99 specifies a requirement for the audited organization to state in writing the corrective actions taken. CSA N286.1-00, CSA N286.2-00, CSA N286.5-95, and CSA N286.6-98 specify a general requirement that management with sufficient authority resolve any identified problems.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.

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	7. FOLLOW-UP ACTION *Follow-up action shall be taken to verify that corrective action is accomplished as scheduled.*	**N286.3-99** **3.16.2 Audits** 3.16.2.7 The auditors shall report to management that a response was received for each deficiency and that action was taken. **N286.4-86** **6. Audit Function** 6.6 Auditors shall bring to the attention of the appropriate level of management the deficiencies revealed by their audits, and shall subsequently confirm that (a) measures have been taken to remedy such deficiencies; and (b) corrective actions have been taken where appropriate.	Only CSA N286.3-99 and CSA N286.4-86 specify requirements for audit follow-up.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.
	8. RECORDS *Audit records shall include audit plans, audit reports, written replies, and the record of completion of corrective action.*	**N286.3-99** 3.16.2 Audits 3.16.2.8 Individual audit plans, audit reports, and completed action reports shall be retained until the plant in-service date.	Only CSA N286.3-99 specifies requirements regarding the composition of audit records.	Significant Difference; No Impact on the ACR QA Program because the differences are covered adequately by the ACR QA Program and the supporting procedures.