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Your ref: Project Number 740
Our ref: DCP/NRC1887

May 16, 2007

Subject: AP1000 COL Standard Technical Report Submittal of APP-GW-GLR-109, Revision 0

In support of Combined License application pre-application activities, Westinghouse is submitting Revision 0 of AP1000 Standard Combined License Technical Report Number 109. This report identifies and justifies standard changes to DCD Sections 17.3, 5.4, 3.8, 5.2 and Appendix 1A in the AP1000 Design Control Document. Changes to the Design Control Document identified in Technical Report Number 109 are intended to be incorporated into FSARs referencing the AP1000 design certification or incorporated into an amended design certification. This report is submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in this report is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification.

The purpose for submittal of this report was explained in a March 8, 2006 letter from NuStart to the NRC.

Pursuant to 10 CFR 50.30(b), APP-GW-GLR-109, Revision 0, "DCD Revision to Incorporate ASME NQA-1-1994 for AP1000," Technical Report Number 109, is submitted as Enclosure 1 under the attached Oath of Affirmation.

It is expected that when the NRC review of Technical Report Number 109 is complete, the changes to the AP1000 DCD identified in Technical Report 109 will be considered approved generically for COL applicants referencing the AP1000 Design Certification.

Questions or requests for additional information related to content and preparation of this report should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Westinghouse requests the NRC to provide a schedule for review of the technical report within two weeks of its submittal.

D079

Very truly yours,

D. F. Hutchings for

A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Attachment

1. "Oath of Affirmation," dated May 16, 2007

/Enclosure

1. APP-GW-GLR-109, Revision 0, "DCD Revision to Incorporate ASME NQA-1-1994 for AP1000," Technical Report Number 109

cc:	D. Jaffe	-	U.S. NRC	1E	1A
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	G. Zinke	-	NuStart/Entergy	1E	1A

ATTACHMENT 1

"Oath of Affirmation"

ATTACHMENT 1

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:	)
NuStart Bellefonte COL Project	)
NRC Project Number 740	)

APPLICATION FOR REVIEW OF
"AP1000 GENERAL COMBINED LICENSE INFORMATION"
FOR COL APPLICATION PRE-APPLICATION REVIEW

B. W. Bevilacqua, being duly sworn, states that he is Vice President, New Plants Engineering, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

Bruce H. Bevilacqua

B. W. Bevilacqua
Vice President
New Plants Engineering

Subscribed and sworn to
before me this 16th day
of May 2007.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Debra McCarthy, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Aug. 31, 2009
Member, Pennsylvania Association of Notaries

Debra McCarthy
Notary

ENCLOSURE 1

APP-GW-GLR-109, Revision 0

"DCD Revision to Incorporate ASME NQA-1-1994 for AP1000"

Technical Report 109

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____ APY: _____

RFS#: _____ RFS ITEM #: _____

AP1000 DOCUMENT NO.	REVISION NO.		ASSIGNED TO
APP-GW-GLR-109	0	Page 1 of ~~10~~ 11	W-AP1000 Projects Quality

ALTERNATE DOCUMENT NUMBER: TR-109 WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: **DCD Revision to Incorporate ASME NQA-1-1994 for AP1000**

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE: None	APP-GW-GEE-203, Rev. 0

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APP-GW-GLR-109, Rev 0.doc	MS-Word	

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Class 3 Documents being transmitted to the NRC require the following two review signatures in lieu of a Form 36.

LEGAL REVIEW Eric S. Gillen	SIGNATURE/DATE Eric S. Gillen 5/11/2007
PATENT REVIEW Daniel J McDermott	SIGNATURE/DATE DJ McDermott 5/10/2007

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ORIGINATOR T. M. Alexovich	SIGNATURE/DATE T M Alexovich 5/10/07
REVIEWERS page by page	SIGNATURE/DATE Linda S Williams 5/10/07

VERIFIER	SIGNATURE/DATE	VERIFICATION METHOD
L. S. Williams	Linda S Williams	page by page
AP1000 RESPONSIBLE MANAGER T. M. Alexovich	SIGNATURE* T M Alexovich	APPROVAL DATE 5/10/07

* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

AP1000 Standard Combined License Technical Report

DCD Revision to Incorporate ASME NQA-1-1994 for AP1000
Revision 0

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1.0 INTRODUCTION

- The purpose of this technical report is to provide the necessary background and justification for revising the version of NQA-1 referenced and committed to in the AP1000 DCD from NQA-1b 1991 to NQA-1 1994. (Chapter 17.3 and other sections as noted in this report.)

- This DCD change has no impact on work previously performed for the AP1000 design and does not represent a reduction in commitment in the AP1000 Quality Assurance program.

- The change is being made to align the version of NQA-1 committed to in AP1000 DCD with current industry and Westinghouse implementation as follows:

    - NQA-1 1994 is the latest version of NQA-1 endorsed by the NRC
    - The latest version of the Standard Review Plan NUREG 0800 references NQA-1 1994
    - Nuclear Energy Institute (NEI) Technical Report 06-14, *"Quality Assurance Program Description,"* which is expected to be the basis for upcoming COL applications, commits to NQA-1 1994
    - The Westinghouse Quality Management System (QMS), Revision 5 accepted by the NRC on 9/13/02 commits to NQA-1 1994
    - ASME Section III NCA-4000 2006 references NQA-1 1994.

2.0 BACKGROUND

In order to assess the impact of this change on the AP1000 design and DCD, an evaluation of changes to NQA-1b 1991 (the version currently identified in the DCD) to NQA-1 1994 was completed.

The evaluation of the changes is provided in the two tables below Table 1: NQA-1c 1992 Changes and Table 2: NQA-1 1994 Changes Based on the evaluation there were no changes to NQA-1 that would either result in a reduction in the current program commitment or impact the current AP1000 design.

Table 1: NQA-1c 1992 Changes

NQA-1 standard page	Location	Change description	Impact
5 - 6.1	S-1, 2	Several definitions reordered (example external audit and internal audit reordered as audit, external and audit, internal). "Should" and "shall" added to definition list to provide reference to their use in existing definition of guideline	No reduction in commitment No AP1000 design impact
11	2S-2, 1	Added additional functions for which personnel need to be qualified	No reduction in commitment No AP1000 design impact
13	2S-3, 3.2.4 2S-3, 3.4	Added 'siting' to the list of quality functions to be audited. Revised word 'test' to "examination"	No reduction in commitment No AP1000 design impact
15	2S-4, 2	Added 'siting' to the list of activities affecting quality	No reduction in commitment No AP1000 design impact
29,30	10S-1, 2	Added paragraph for inspection requirements	No reduction in commitment No AP1000 design impact
63.2	16A-1, 3.2.2	Removed allowance related to obsolete drawings	No reduction in commitment No AP1000 design impact

Table 2: NQA-1 1994 Changes

NQA-1 standard page	Location	Change description	Impact
Entire standard	Entire standard	The standard was reformatted and renumbered. No additional changes were made from NQA-1c 1992	No reduction in commitment No AP1000 design impact

NQA-2 restructured into NQA-1 Part II

As part of the restructuring of NQA-1 in 1994, NQA-2 was incorporated into NQA-1 as Part II. The NQA-2 Part references (example: NQA-2 Part 2.1) were restructured as NQA-1 Subparts (NQA-1 Subpart 2.1). The previous references to NQA-2 in the DCD have been have been modified to reference the appropriate NQA-1 Subpart of the restructured NQA-1 (1994) standard. This change and proper references are reflected in Appendix 1A, Chapter 3 paragraph 3.8.3.6 and Chapter 5 paragraphs 5.2.3.4.1, 5.4.2.4.1, 5.4.2.6, 5.4.3.5 and 5.4.5.4.

3.0 REGULATORY IMPACT

The changes to the DCD presented in this report do not represent an adverse change to the design function or to how design functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

The changes to the DCD presented in this report do not result in an impact on features that mitigate severe accidents.

The changes to the DCD presented in this report will not alter barriers or alarms that control access to protected areas of the plant. The changes to the DCD presented in this report will not alter requirements for security personnel. Therefore, the changes to the DCD presented in this report do not have an adverse impact on the security assessment of the AP1000.

4.0 DCD MARK-UP

The following pages show the DCD mark-ups describing the change in commitment to NQA-1 1994.

CHAPTER 17

QUALITY ASSURANCE

17.1 Quality Assurance During the Design and Construction Phases
See Section 17.5.

17.2 Quality Assurance During the Operations Phase
See Section 17.5.

17.3 Quality Assurance During Design, Procurement, Fabrication, Inspection, and/or Testing of Nuclear Power Plant Items

This section outlines the quality assurance program applicable to the design, procurement, fabrication, inspection, and/or testing of items and services for the AP1000 Project. The design for AP1000 is based upon employing the design of AP600 to the maximum extent possible. As a result, a continuous quality program spanning AP600 design as well as AP1000 design has been used. Westinghouse has and will continue to maintain a quality assurance program meeting the requirements of 10 CFR 50 Appendix B for the AP1000 program that will be applicable to the design, procurement, fabrication, inspection, and/or testing activities.

Effective March 31, 1996, activities affecting the quality of items and services for the AP600 Project during design, procurement, fabrication, inspection, and/or testing were being performed in accordance with the quality plan described in "Westinghouse Electric Corporation – Energy Systems Business Unit, Quality Management System," (Reference 1). The Quality Management System (QMS) has been maintained as the Quality Plan for the AP1000 program and subsequent revisions have been submitted to and accepted by the NRC as meeting the requirements of 10 CFR 50 Appendix B.

Prior to introduction of the QMS as the quality plan applicable to the AP1000 project, activities on the AP600/AP1000 program were performed in accordance with topical report WCAP 8370 (References 2 and 3), *Westinghouse Energy Systems Business Unit/Power Generation Business Unit Quality* Assurance Plan. WCAP 8370 was subsequently superceded by the Westinghouse QMS to describe the quality assurance plan and Westinghouse commitments to meet the requirements of 10 CFR 50 Appendix B.

The current Westinghouse quality plan for work being performed on the AP1000 is the Westinghouse Electric Company Quality Management System (QMS) (Reference 9). The referenced revision of the QMS was accepted by the NRC as meeting the requirements of 10 CFR 50, Appendix B, on September 13, 2002.

A project-specific quality plan was issued to supplement the quality management system document and the topical reports for design activities affecting the quality of structures, systems, and components for the AP600 project (Reference 4). This plan ~~addresses~~ referenced the NQA-1-1989 edition through NQA-1b-1991 addenda and ~~is~~ was applicable to work performed for the AP1000 design prior to March 16, 2007.

Effective March 16, 2007, NQA-1 1994 is the applicable revision of NQA-1 for work performed for the AP1000 project. As such, a project specific quality plan is no longer required and the Westinghouse Electric Company Quality Management System (QMS) (Reference 9) is the quality program for work performed for the AP1000 project.

Appendix 1A DCD Mark-up

Reg. Guide 1.28, Rev. 3, 8/85 – Quality Assurance Program Requirements (Design and Construction)

General	ANSI/ASME N45.2-1977 ANSI/ASME NQA-1-1983 through NQA-1a-1983 Addenda	Conforms	The Westinghouse quality assurance program is described in Chapter 17. Refer to "Westinghouse Electric Company Quality Management System" (QMS) referenced therein for Westinghouse positions on regulatory guides within the scope of the quality assurance program. In some cases current industry consensus standards have replaced the standards specifically referenced by certain regulatory guides. In particular, the N45.2 series standards have been replaced by ASME NQA-1 ~~and NQA-2~~. Therefore, the "Quality Management System" may reference ASME NQA-1 ~~and NQA-2~~ rather than the N45.2 series standards when describing the Westinghouse position. QMS ~~Revision 4~~ complies with ASME NQA-1-1994.
2.	Criteria 17 10 CFR 50 Appendix B	Conforms	

Appendix 1A DCD Mark-up

Reg. Guide 1.37, Rev. 0, 3/73 – Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water Cooled Nuclear Power Plants

General	ANSI N45.2.1-1973	Exception	The ANSI N45.2 series of standards that are referenced by the current revisions of the Quality Assurance regulatory guides have been replaced by ASME NQA-1 ~~and NQA-2~~. ANSI N45.2.1, which is referenced in Regulatory Guide 1.37, has been incorporated into ~~NQA-2 Part 2.1~~ NQA-1 Subpart 2.1. The technical requirements specified in ANSI N45.2.1 and ~~NQA-2 Part 2.1~~ NQA-1 Subpart 2.1 are compatible. Therefore, compliance with ~~NQA-2 Part 2.1~~ NQA-1 Subpart 2.1 satisfies Regulatory Guide 1.37. See Section 17.5 for the Combined License information item.

Reg. Guide 1.38, Rev. 2, 5/77 – Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage and Handling of Items for Water-Cooled Nuclear Power Plants

General	ANSI N45.2.2-1972	Exception	The ANSI N45.2 series of standards that are referenced by the current revisions of the Quality Assurance regulatory guides have been replaced by ASME NQA-1 ~~and NQA-2.~~ Refer to the Regulatory Guide 1.28 position. See Section 17.5 for the Combined License information item.

Reg. Guide 1.39, Rev. 2, 9/77 – Housekeeping Requirements for Water-Cooled Nuclear Power Plants

General	ANSI N45.2.3-1973	Exception	The ANSI N45.2 series of standards that are referenced by the current revisions of the Quality Assurance regulatory guides have been replaced by ASME NQA-1 ~~and NQA-2~~. Refer to

the Regulatory Guide 1.28 position. See Section 17.5 for the Combined License information item.

DCD Paragraph Mark-ups

3.8.3.6 Materials, Quality Control, and Special Construction Techniques

Subsection 3.8.4.6 describes the materials and quality control program used in the construction of the containment internal structures. The structural steel modules are constructed using A36 plates and shapes. Nitronic 33 (American Society for Testing and Materials 240, designation S24000, Type XM-29) stainless steel plates are used on the surfaces of the modules in contact with water during normal operation or refueling. The structural wall and floor modules are fabricated and erected in accordance with AISC-N690. Loads during fabrication and erection due to handling and shipping are considered as normal loads as described in subsection 3.8.4.3.1.1. Packaging, shipping, receiving, storage and handling of structural modules are in accordance with ~~NQA-2, Part 2.2~~ NQA-1 Subpart 2.2 (formerly ANSI/ASME N45.2.2 as specified in AISC N690).

5.2.3.4.1 Cleaning and Contamination Protection Procedures

Austenitic stainless steel materials used in the fabrication, installation, and testing of nuclear steam supply components and systems are handled, protected, stored, and cleaned according to recognized, accepted methods designed to minimize contamination that could lead to stress corrosion cracking. The procedures covering these controls are stipulated in process specifications. Tools used in abrasive work operations on austenitic stainless steel, such as grinding or wire brushing, do not contain and are not contaminated with ferritic carbon steel or other materials that could contribute to intergranular cracking or stress-corrosion cracking.

These process specifications supplement the equipment specifications and purchase order requirements of every individual austenitic stainless steel component or system procured for the AP1000, regardless of the ASME Code classification.

The process specifications define these requirements and follow the guidance of ASME ~~NQA-2~~ NQA-1.

Subsection 1.9.1 indicates the degree of conformance of the austenitic stainless steel components of the reactor coolant pressure boundary with Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants."

5.4.2.4.1 Selection and Fabrication of Materials

The pressure boundary materials used in the steam generator are selected and fabricated in accordance with the requirements of Section II and III of the ASME Code. Subsection 5.2.3 contains a general discussion of material specifications. Table 5.2.3-1 lists the types of materials. Fabrication of reactor coolant pressure boundary materials is also discussed in subsection 5.2.3, particularly in subsections 5.2.3.3 and 5.2.3.4.

Industry-wide corrosion testing and specification development programs have justified the selection of thermally treated Alloy 690, a nickel-chromium-iron alloy (ASME SB-163), for the steam generator tubes. The channel head divider plate is also Alloy 690 (ASME SB-168). The interior surfaces of the reactor coolant channel head, nozzles, and manways are clad with austenitic stainless steel. The primary side of the tubesheet is weld clad with nickel-chromium-iron alloy (ASME SFA-5.14). The tubes are then seal welded to the tubesheet cladding. These fusion welds, comply with Sections III and IX of the ASME Code. The welds are dye-penetrant inspected and leak-tested before each tube is hydraulically expanded the full depth of the tubesheet bore.

Nickel-chromium-iron alloy in various forms is used for parts where high velocities could otherwise lead to erosion/corrosion. These include the nozzles on the feedwater ring, startup feedwater sparger, and some primary separator parts.

Subsection 5.2.1 discusses authorization for use of ASME Code cases used in material selection. Subsection 1.9.1 discusses the extent of conformance with Regulatory Guides 1.84, Design and Fabrication Code Case Acceptability ASME Section III, Division 1, and 1.85, Materials Code Case Acceptability ASME Section III, Division 1.

During manufacture, the primary and secondary sides of the steam generator are cleaned according to written procedures following the guidance of Regulatory Guide 1.37, Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants, and ASME ~~NQA-2~~ NQA-1 Part II.

Onsite cleaning and cleanliness control also follow the guidance of Regulatory Guide 1.37 (discussed in subsection 1.9.1). Cleaning process specifications are discussed in subsection 5.2.3.4.

Subsection 5.2.3.3 discusses the fracture toughness of the materials. Adequate fracture toughness of ferritic materials in the reactor coolant pressure boundary is provided by compliance with 10 CFR 50, Appendix G, Fracture Toughness Requirements, and Paragraph NB-2300 of Section III of the ASME Code.

The heat and lot of tubing material for each steam generator tube is recorded and documented as part of the quality assurance records. Archive samples of each heat and lot of steam generator tubing material are provided to the Combined License applicant for use in future materials testing programs or as inservice inspection calibration standards. A minimum of 7 feet of tubing in the final heat treat condition is supplied.

The exterior of the steam generator surface may be submerged following a postulated actuation of the automatic depressurization system (ADS). During this event, water may be present on the outside of the steam generator without affecting the heat transfer or pressure boundary capabilities of the AP1000 steam generator.

5.4.2.6 Quality Assurance

The steam generator is constructed to a quality assurance program that meets the requirements of the ASME Code and ~~ANSI~~/ASME NQA-1 ~~and NQA-2~~. Table 5.4-6 outlines the testing included in the steam generator quality assurance program.

The radiographic inspection and acceptance standard comply with the requirements of Section III of the ASME Code per applicable Code Year and Addenda.

5.4.3.5 Test and Inspections

The reactor coolant system piping construction is subject to a quality assurance program. The pressure boundary components meet requirements established by the ASME Code and ~~ANSI~~/ASME NQA-1 ~~and NQA-2~~. The testing included in the reactor coolant system piping quality assurance program is outlined in Table 5.4-8.

A transverse tension test conforming with the supplementary requirements S2 of material specification ASME SA-376 applies to each heat of pipe material.

5.4.5.4 Tests and Inspections

The pressurizer construction is subject to a quality assurance program. The pressure boundary components meet requirements established by the ASME Code and ~~ANSI~~/ASME NQA-1 ~~and NQA-2.~~ Table 5.4-12 outlines the testing included in the pressurizer quality assurance program.

The design of the pressurizer permits the inspection program prescribed by the ASME Code, Section XI. To implement the requirements of the ASME Code, Section XI, the following welds, when present, are designed and constructed to present a smooth transition surface between the parent metal and the weld metal. The weld surface is ground smooth for ultrasonic inspection.