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Your ref: Project Number 740  
Our ref: DCP/NRC1790

October 6, 2006

**Subject: AP1000 COL Standard Technical Report Submittal**

In support of Combined License application pre-application activities, Westinghouse is submitting Revision 0 of AP1000 Standard Combined License Technical Report Number 11b. The purpose of this report is to provide partial closure of COL information item 3.9-2 by completing the accumulator design specification and making it available for audit after November 13, 2006. 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 U.S. Nuclear Regulatory Commission.

Pursuant to 10 CFR 50.30(b), APP-GW-GLR-049, Revision 0, "Accumulator Design Specification and Reports Summary," Technical Report Number 11b, is submitted as Enclosure 1 under the attached Oath of Affirmation.

It is expected that when the NRC review of Technical Report 11b is complete, the NRC should consider the COL item to make the design specifications and design reports for ASME Section III components available for audit to be closed relative to the accumulator, and the design generically applicable to all COL applications referencing the AP1000 Design Certification.

Questions or requests for additional information related to the 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.

Very truly yours,



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

/Attachment

1. "Oath of Affirmation," dated October 6, 2006

/Enclosure

1. APP-GW-GLR-049, Revision 0, "Accumulator Design Specification and Reports Summary," Technical Report Number 11b, dated October 2006.

cc:	S. Bloom	- U.S. NRC	1E	1A
	S. Coffin	- U.S. NRC	1E	1A
	G. Curtis	- TVA	1E	1A
	P. Grendys	- Westinghouse	1E	1A
	P. Hastings	- Duke Power	1E	1A
	C. Ionescu	- Progress Energy	1E	1A
	D. Lindgren	- Westinghouse	1E	1A
	A. Monroe	- SCANA	1E	1A
	M. Moran	- Florida Power & Light	1E	1A
	C. Pierce	- Southern Company	1E	1A
	E. Schmiech	- Westinghouse	1E	1A
	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 )

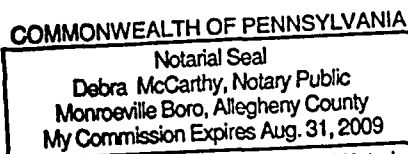
APPLICATION FOR REVIEW OF  
"API1000 GENERAL COMBINED LICENSE INFORMATION"  
FOR COL APPLICATION PRE-APPLICATION REVIEW

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.



B. W. Bevilacqua  
Vice President  
New Plants Engineering

Subscribed and sworn to  
before me this 6<sup>th</sup> day  
of October 2006.



Member, Pennsylvania Association of Notaries  
Notary

ENCLOSURE 1

APP-GW-GLR-049, Revision 0

“Accumulator Design Specification and Reports Summary”

Technical Report Number 11b

# AP1000 DOCUMENT COVER SHEET

TDC:

Permanent File:

APY

RFS#:

RFS ITEM #:

AP1000 DOCUMENT NO. <b>APP-GW-GLR-049</b>	REVISION NO. <b>0</b>	Page 1 of 5	ASSIGNED TO <b>W-Sterdis</b>
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ALTERNATE DOCUMENT NUMBER:

WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Co. - NPP

TITLE: **Accumulator Design Specification and Design Report Summary**

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
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CALCULATION/ANALYSIS REFERENCE:	
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ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
APP-GW-GLR-049 R0.doc	MS Word	

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PATENT REVIEW Mike Corletti	SIGNATURE/DATE <i>Mike Corletti</i> 10/6/06

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REVIEWERS Don Lindgren	SIGNATURE/DATE <i>Don Lindgren</i> 10/6/2006

VERIFIER John Solenski <i>See Following Page</i>	SIGNATURE/DATE	VERIFICATION METHOD
AP1000 RESPONSIBLE MANAGER Ken Quinn	SIGNATURE* <i>D.A. Wiseman For Ken Quinn</i>	APPROVAL DATE 10/6/06

\* 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.

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ORIGINATOR Dale Wiseman	SIGNATURE/DATE <i>Dale A. Wiseman</i> 10/6/06	
REVIEWERS Don Lindgren	SIGNATURE/DATE <i>Don Lindgren</i> 10/6/2006	
VERIFIER John Solanski	SIGNATURE/DATE <i>John Solanski</i> 10/6/06	VERIFICATION METHOD <i>Final Review</i>
AP1000 RESPONSIBLE MANAGER Ken Quinn	SIGNATURE*	APPROVAL DATE

\* 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

## Accumulator Design Specification and Design Report Summary

Revision 0

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Nuclear Power Plants  
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Pittsburgh, PA 15230-0355

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## INTRODUCTION

The purpose of this report is to provide partial closure of a Combined Operating License (COL) information item by completing the accumulator design specification and design report and making them available for audit.

The completion of the accumulator design specification and design report for audit is identified as COL Information Item 3.9-2 (FSER Action 3.9.2.4-1) in DCD Subsection 3.9.8.2 to be completed by the Combined License applicant.

The COL item from the DCD reads:

“Combined License applicants referencing the AP1000 design will have available for NRC audit the design specifications and design reports prepared for ASME Section III components. Combined License applicants will address consistency of the reactor vessel core support materials relative to known issues of irradiation-assisted stress corrosion cracking or void swelling (see subsection 4.5.2.1). *[The design report for the ASME Class 1, 2, and 3 piping will include the reconciliation of the as-built piping as outlined in subsection 3.9.3. This reconciliation includes verification of the thermal cycling and stratification loadings considered in the stress analysis discussed in subsection 3.9.3.1.2.]\**”

There are several ASME Section III components. In order to facilitate the review process, the design specifications and design reports are being made available for audit as they are completed for each individual component. The core makeup tank design specification and design report have been made available for audit via APP-GW-GLR-048 (October 2006). The remaining eight ASME Section III component design specifications and design reports are scheduled for completion between January and July 2007.

The consistency of the reactor vessel core support materials relative to known issues of irradiation-assisted stress corrosion cracking or void swelling was addressed in WCAP-16620, Consistency of Reactor Vessel Internals Core Support Structure Materials Relative to Known Issues of Irradiation-Assisted Stress Corrosion Cracking (IASSC) and Void Swelling for the AP1000 Plant (July 2006). The as-built COL items were addressed generically in APP-GW-GLR-021 (June 2006).

With the completion of the design specification and design report as outlined in this report, the NRC should consider the COL item to make the design specifications and design reports for ASME Section III components available for audit to be closed relative to the accumulator.

## TECHNICAL BACKGROUND

The accumulator is a safety-related tank which is part of the passive core cooling system (PXS). The PXS is designed to provide sufficient core cooling during design basis events. There are two accumulator tanks in the PXS.

The accumulators contain borated water and compressed nitrogen cover gas to provide a rapid water injection if required during a design basis event. The accumulators are located inside the reactor containment building. During normal operation the accumulators are isolated from the reactor coolant system by two check valves arranged in series. The temperature of the borated water in the accumulators is about the same as the containment ambient temperature since the tanks are not insulated or heated. When the reactor coolant system pressure falls below the accumulator pressure, the check valves open and borated water is discharged into the reactor vessel downcomer through a direct vessel injection line.

The accumulators are spherical tanks made of low alloy steel and clad on the internal surface with stainless steel. The lower head includes a skirt support. In addition to the water discharge nozzle, the accumulator tanks include nozzle connections for remote nitrogen supply, water makeup, water sampling, and nitrogen venting.

The design pressure and temperature for the accumulators are 800 psig and 300 °F, respectively.

The accumulator tank is an AP1000 Equipment Class C component which is designed to meet seismic Category I requirements and analyzed to meet the applicable criteria of the ASME Boiler and Pressure Vessel Code, Section III, 1998 Edition with 2000 Addenda. The criteria of Subsection ND are used for the tank verification and Subsection NF criteria are used for support skirt verification.

Detailed stress analyses were completed for the tank shell, manway assembly including cover and bolts, outlet nozzle, 1-inch nozzles, and support skirt. The results of the analyses show compliance with the structural requirements of the design specification and the allowable stresses as given in the appropriate ASME Code subsection. The analytical work documented in the design report is sufficient to conclude that the final margins of safety will comply with the applicable requirements of the ASME Code, as well as the additional structural requirements of the design specification.

The final, complete ASME Code stress report will be made available to the NRC for audit as required by Tier 1 Inspections, Tests, Analyses, and Acceptance Criteria 2a in Table 2.2.3-4, after the fabrication of the accumulators is completed and as-built dimensions are reconciled.

## REGULATORY IMPACT

The completion of ASME Section III component design specifications and design reports for audit are discussed in Subsection 3.9 of the NRC Final Safety Evaluation Report (FSER) for the AP1000. Making the accumulator design specification and design report available for audit is part of COL Action Item 3.9.2.4-1 as identified in the FSER. The completion of the accumulator design specification and design report for audit does not alter the conclusions in the FSER.

## DCD MARKUP

As a result of the completion of the accumulator design specification and design report for audit, the text in DCD Tier 2, Subsection 3.9.8.2 is modified and Reference 22 is added to DCD Subsection 3.9.9. See below for changes to these two subsections.

### 3.9.8.2 Design Specifications and Reports

Combined License applicants referencing the AP1000 design will have available for NRC audit the design specifications and design reports prepared for ASME Section III components. The design specification and design report for the accumulator are made available for NRC audit via APP-GW-GLR-049 (Reference 22). Combined License applicants will address consistency of the reactor vessel core support materials relative to known issues of irradiation-assisted stress corrosion cracking or void swelling (see subsection 4.5.2.1). *[The design report for the ASME Class 1, 2, and 3 piping will include the reconciliation of the as-built piping as outlined in subsection 3.9.3. This*

*reconciliation includes verification of the thermal cycling and stratification loadings considered in the stress analysis discussed in subsection 3.9.3.1.2.]\**

**3.9.9****References**

22. APP-GW-GLR-049, Accumulator Design Specification and Design Report Summary, Westinghouse Electric Company, LLC, October 2006.