Westinghouse Electric Company
Nuclear Power Plants
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Direct tel: 412-374-6306
Direct fax: 412-374-5005
e-mail: sterdia@westinghouse.com

Your ref: Project Number 740
Our ref: DCP/NRC1835

February 19, 2007

Subject: AP1000 COL Standard Technical Report Submittal of APP-GW-GLN-074, Revision 0

In support of Combined License application pre-application activities, Westinghouse is submitting AP1000 Standard Combined License Technical Report Number 74B. This report identifies and justifies standard changes to the AP1000 Design Control Document (DCD). These changes impact DCD Chapter 16 and are related to changes to the Short Term Availability Controls. The changes to the DCD identified in Technical Report 74B are intended to be incorporated into FSARs referencing the AP1000 Design Certification or incorporated into the design certification by an amendment to the 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-GLN-074, Revision 0, "Completion of Investment Protection Short-Term Availability Controls," (Technical Report Number 74B), is submitted as Enclosure 1 under the attached Oath of Affirmation.

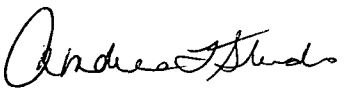
It is expected that when the NRC review of Technical Report Number 74B is complete, the changes to the DCD identified in Technical Report 74B will be considered approved generically for COL applicants referencing the AP1000 Design Certification.

Westinghouse is hereby requesting review and approval of the design changes associated with the Reactor Internals.

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 for additional information 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.

D079

Very truly yours,



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

/Attachment

1. "Oath of Affirmation," dated February 19, 2007

/Enclosures

1. APP-GW-GLN-074, Revision 0, "Completion of Investment Protection Short-Term Availability Controls," Technical Report Number 74B

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

W. E. Cummins, being duly sworn, states that he is Vice President, Regulatory Affairs & Standardization, 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.

W. E. Cummins
Vice President
Regulatory Affairs & Standardization

Subscribed and sworn to
before me this 19th day
of February 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-GLN-074, Revision 0

"Completion of Investment Protection Short-Term Availability Controls"

Technical Report 74B

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____ APY: _____

RFS#: _____ RFS ITEM #: _____

AP1000 DOCUMENT NO.	REVISION NO.		ASSIGNED TO
APP-GW-GLN-074	0	Pages 14	W-J. Winters

ALTERNATE DOCUMENT NUMBER: TR74B WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: Completion of Investment Protection Short-Term Availability Controls

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE:	

ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
APP-GW-GLN-074	Microsoft Word	

☒ WESTINGHOUSE CLASS 3 (NON PROPRIETARY)

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

LEGAL REVIEW T. White	SIGNATURE/DATE 2/19/2007
PATENT REVIEW M. Corletti	SIGNATURE/DATE 2/16/07

☐ WESTINGHOUSE PROPRIETARY CLASS 2

This document is the property of and contains Proprietary Information owned by Westinghouse Electric Company LLC and/or its subcontractors and suppliers. It is transmitted to you in confidence and trust, and you agree to treat this document in strict accordance with the terms and conditions of the agreement under which it was provided to you.

ORIGINATOR C. Steuck	SIGNATURE/DATE 2/16/07	
REVIEWERS T. Schulz	SIGNATURE/DATE T. L. Schulz 2/16/07	
VERIFIER A. Trupiano	SIGNATURE/DATE 2/19/07	VERIFICATION METHOD Page by Page
AP1000 RESPONSIBLE MANAGER J. Winters	SIGNATURE* T. L. Schulz for J. WINTERS	APPROVAL DATE 2/19/07

* 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.

February 2007

AP1000 Standard Combined License Technical Report

Title: Completion of Investment Protection Short-Term Availability Controls

Westinghouse Electric Company LLC
P.O. Box 355
Pittsburgh, PA 15230-0355

Document Number: APP-GW-GLN-074 **Revision Number:** 0

Title: Completion of Investment Protection Short-Term Availability Controls

Brief Description of the change (what is being changed and why):

This report summarizes changes to section 16.3 of the DCD. The major changes to this section are the verification of the bracketed items and the removal of the brackets. The values provided in this document are expected to be standard for all AP1000 plants; therefore, providing this information will allow the NRC to review it once for licensing purposes.

I. APPLICABILITY DETERMINATION

This evaluation is prepared to document that the change described above is a departure from Tier 2 information of the AP1000 Design Control Document (DCD) that may be included in plant specific FSARs without prior NRC approval.

A.	Does the proposed change include a change to:		
	1. Tier 1 of the AP1000 Design Control Document APP-GW-GL-700	☒ NO ☐ YES	(If YES prepare a report for NRC review of the changes)
	2. Tier 2* of the AP1000 Design Control Document, APP-GW-GL-700	☐ NO ☒ YES	(If YES prepare a report for NRC review of the changes)
	3. Technical Specification in Chapter 16 of the AP1000 Design Control Document, APP-GW-GL-700	☒ NO ☐ YES	(If YES prepare a report for NRC review of the changes)
B.	Does the proposed change involve:		
	1. Closure of a Combined License Information Item identified in the AP1000 Design Control Document, APP-GW-GL-700	☒ NO ☐ YES	(If YES prepare a COL item closure report for NRC review.)
	2. Completion of an ITAAC item identified in Tier 1 of the AP1000 Design Control Document, APP-GW-GL-700	☒ NO ☐ YES	(If YES prepare an ITAAC completion report for NRC review.)

☐ The questions above are answered no, therefore the departure from the DCD in a COL application does not require prior NRC review unless review is required by the criteria of 10 CFR Part 52 Appendix D Section VIII B.5.b. or B.5c

II. TECHNICAL DESCRIPTION AND JUSTIFICATION

This report details the changes made to section 16.3 of the DCD. The bracketed items found in section III of this report have been verified and the brackets have been removed from these values. Where applicable, the bracketed items have been updated to reflect the current AP1000 design. The changes are as follows:

- After discussions with NuStart an agreement has been reached to remove the brackets from each mention of chief nuclear officer and on-call alternate.
- In Table 1.1-1, DAS ATWS Functions and Table 1.2-1, DAS ESF Functions, the steam generator wide range setpoint has been updated to reflect the value used when performing the ATWS

evaluation. Words have been added to the Initiating Signal to clarify whether the signals are high or low.

- In Table 1.2-1, DAS ESFA Functions, the HL Temp setpoint has been updated to reflect the value used when performing the PRA success criteria analysis. Words have been added to the Initiating Signal to clarify whether the signals are high or low.
- SR 2.2.1, the RNS pump flow, has been changed to reflect the current AP1000 RNS pumps.
- SR 2.3.1 has been updated to reflect the updated component cooling water pumps.
- SR 2.4.1 has been updated to reflect the updated service water pumps. These changes will be reflected in DCP APP-GW-GEE-152 which is in process and has not been released.
- SR 2.5.1, the ancillary tank water volume, has been updated to reflect the current AP1000 ancillary tank design.

III. DCD MARK-UP

Tier 2

In chapter 16.3 revise Table 16.3-2 as follows:

For all mentions of "[chief nuclear officer]" and "[on-call alternate]", the brackets will be removed to yield "chief nuclear officer" and "on-call alternate." There are 27 such mentions in chapter 16.3. An example is shown below.

1.0 Instrumentation Systems

1.1 Diverse Actuation System (DAS) ATWS Mitigation

OPERABILITY: DAS ATWS mitigation function listed in Table 1.1-1 should be operable

APPLICABILITY: MODE 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DAS ATWS Function with one or more required channels inoperable.	A.1 Notify ⟦ chief nuclear officer ⟧ or ⟦ on-call alternate ⟧. AND A.2 Restore required channels to operable status.	72 hours 14 days
B. Required Action and associated Completion	B.1 Submit report to ⟦ chief nuclear officer ⟧ or ⟦ on-call alternate ⟧	1 day

Time of Condition A not met.		detailing interim compensatory measures, cause for inoperability, and schedule for restoration to OPERABLE.	
	AND		
	B.2	Document in plant records the justification for the actions taken to restore the function to OPERABLE.	1 month

Revise Table 1.1-1 in Subsection 1.1 as follows:

1.0 Instrumentation Systems

1.1 Diverse Actuation System (DAS) ATWS Mitigation

Table 1.1-1, DAS ATWS Functions

DAS Function	Initiating Signal	Number Installed	Channels Required	Setpoint
Rod Drive MG Set Trip, Turbine Trip and PRHR HX Actuation	SG Wide Range Level - Low	2 per SG	1 per SG	> ~~[55,000 lb]~~ 27 %

Revise Table 1.2-1 in Subsection 1.2 as follows:

1.0 Instrumentation Systems

1.2 DAS Engineering Safeguards Features Actuation (ESFA)

Table 1.2-1, DAS ESFA Functions

DAS Function	Initiating Signal	Number Installed	Channels Required	Setpoint
PRHR HX Actuation	SG Wide Level - Low or	2 per SG	1 per SG	> ~~[55,000 lb]~~ 27 %
	HL Temp - High	1 per HL	1 per HL	< ~~[625]~~ 636 F
CMT Actuation and RCP trip	Pzr Level - Low	2	2	> [7] %
Passive Cont. Cooling and Selected Cont. Isolation Actuation	Cont. Temp - High	2	2	< [200] F

Revise SR 2.1.1 in Subsection 2.1 as follows:

2.0 Plant Systems

2.1 Normal Residual Heat Removal System (RNS)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.1.1	Verify that one RNS pump develops a differential head of [330] feet on recirculation flow	92 days
SR 2.1.2	Verify that the following valves stroke open RNS V011 RNS Discharge Cont. Isolation RNS V022 RNS Suction Header Cont. Isolation RNS V023 RNS Suction from IRWST Isolation RNS V055 RNS Suction from Cask Loading Pit	92 days

Revise SR 2.2.1 in Subsection 2.2 as follows:

2.0 Plant Systems

2.2 Normal Residual Heat Removal System (RNS) - RCS Open

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.2.1	Verify that one RNS pump is in operation and that each RNS pump operating individually circulates reactor coolant at a flow > ~~[900]~~ 1580 gpm OR Verify that both RNS pumps are in operation and circulating reactor coolant at a flow > ~~[1800]~~ 2000 gpm	Within 1 day prior to entering the MODES of applicability

Revise SR 2.3.1 in Subsection 2.3 as follows:

2.0 Plant Systems

2.3 Component Cooling Water System (CCS) - RCS Open

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.3.1	Verify that one CCS pump is in operation and each CCS pump operating individually provides a CCS flow through one RNS heat exchanger > ~~[2820]~~ 2685 gpm OR Verify that both CCS pumps are in operation and the CCS flow through each RNS heat exchanger is > ~~[2820]~~ 2685 gpm	Within 1 day prior to entering the MODES of applicability

Revise SR 2.4.1 in Subsection 2.4 as follows:

2.0 Plant Systems

2.4 Service Water System (SWS) - RCS Open

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.4.1	Verify that one SWS pump is operating and that each SWS pump operating individually provides a SWS flow > ~~[8600]~~ 10,000 gpm	Within 1 day prior to entering the MODES of applicability
SR 2.4.2	Operate each cooling tower fan for > 15 min	Within 1 day prior to entering the MODES of applicability

Revise SR 2.5.1, SR 2.5.2, and SR 2.5.3 in Subsection 2.5 as follows:

2.0 Plant Systems

2.5 Passive Containment ~~System~~ Cooling Water Storage Tank (PCCWST) and Spent Fuel Pool Makeup - Long Term Shutdown

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.5.1	Verify water volume in the PCS ancillary tank is > ~~[580,000]~~ 780,000 gal.	31 days
SR 2.5.2	Record that the required PCS recirculation pump provides recirculation of the PCCWST at > [100] gpm.	92 days
SR 2.5.3	Verify that each PCS recirculation pump transfers > [100] gpm from the PCS ancillary tank to the PCCWST. During this test, each PCS recirculation pump will be powered from an ancillary diesel.	10 years

Revise SR 2.8.1 in Subsection 2.8 as follows:

2.0 Plant Systems

2.8 Hydrogen Ignitors

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 2.8.1	Energize each required hydrogen ignitor and verify the surface temperature is > [1700]°F.	Each refueling outage

Revise paragraph in Subsection 2.8 as follows:

2.0 Plant Systems

2.8 Hydrogen Ignitors

BASES:

The hydrogen ignitors should be available to provide the capability of burning hydrogen generated during severe accidents in order to prevent failure of the containment due to hydrogen detonation. These hydrogen ignitors are required by 10 CFR 50.34 to limit the buildup of hydrogen to less than 10% assuming that 100% of the active zircaloy fuel cladding is oxidized.

This function is also important because it provides margin in the PRA sensitivity performed assuming no credit for nonsafety-related SSCs to mitigate at-power and shutdown events. The margin provided in the PRA study assumes a minimum availability of 90% for this function during the MODES of applicability, considering both maintenance unavailability and failures to operate.

The ignitors are distributed in the containment to limit the buildup of hydrogen in local areas. Two groups of ignitors are provided in each area; one of which is sufficient to limit the buildup of hydrogen. When an ignitor is energized, the ignitor surface heats up to ≥ [1700]°F. This temperature is sufficient to ignite hydrogen in the vicinity of the ignitor when the lower flammability limit is reached. DCD subsection 6.2.4 provides additional information.

The hydrogen ignitor function should be available during MODES 1 and 2 when core decay heat is high and during MODE 5 when the RCS pressure boundary is open and in MODE 6 when the refueling cavity is not full. Planned maintenance should be performed on hydrogen ignitors when they are not required to meet this availability control. Table 2.8-1 indicates the minimum number of hydrogen ignitors that should be available.

Revise SR 3.1.1, SR 3.1.2, SR 3.1.3, and SR 3.1.4 1.1-1 in Subsection 3.1 as follows:

3.0 Electrical Power Systems

3.1 AC Power Supplies

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.1	Verify that the fuel oil volume in the required standby diesel generator fuel tank is > [50,000] gal.	31 days
SR 3.1.2	Record that the required fuel oil transfer pump provides a recirculation flow of > [8] gpm.	92 days
SR 3.1.3	Verify that the required standby diesel generator starts and operates at > [4000] kw for > 1 hour. This test may utilize diesel engine prelube prior to starting and a warmup period prior to loading.	92 days
SR 3.1.4	Verify that each standby diesel generator starts and operates at > [4000] kw for > 24 hours. This test may utilize diesel engine prelube prior to starting and a warmup period prior to loading. Both diesel generators will be operated at the same time during this test.	10 years

Revise SR 3.3.1 in Subsection 3.3 as follows:

3.0 Electrical Power Systems

3.3 AC Power Supplies - Long Term Shutdown

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.1	Verify fuel volume in the ancillary fuel tank is > [600] gal	31 days
SR 3.3.2	Verify that the required diesel generator starts and operates for >1 hour connected to a test load > [35] kw. This test may utilize diesel engine warmup period prior to loading.	92 days

Document Number: APP-GW-GLN-074 **Revision Number:** 0

Title: Completion of Investment Protection Short-Term Availability Controls

IV. REGULATORY IMPACT

A. FSER IMPACT

These changes have no impact on the text or conclusions of the AP1000 FSER.

B. SCREENING QUESTIONS (Check correct response and provide justification for that determination under each response)

1. Does the proposed change involve a change to an SSC that adversely affects a DCD described design function? ☐ YES ☒ NO

   The proposed changes do not involve a change to an SSC that adversely affects a DCD described design function.

2. Does the proposed change involve a change to a procedure that adversely affects how DCD described SSC design functions are performed or controlled? ☐ YES ☒ NO

   The proposed changes do not involve a change to a procedure that adversely affects how DCD described SSC design functions are performed or controlled.

3. Does the proposed activity involve revising or replacing a DCD described evaluation methodology that is used in establishing the design bases or used in the safety analyses? ☐ YES ☒ NO

   The proposed changes do not involve revising or replacing a DCD described evaluation methodology that is used in establishing the design bases or used in the safety analyses.

4. Does the proposed activity involve a test or experiment not described in the DCD, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the DCD? ☐ YES ☒ NO

   The proposed changes do not involve a test or experiment not described in the DCD.

C. EVALUATION OF DEPARTURE FROM TIER 2 INFORMATION (Check correct response and provide justification for that determination under each response)

10 CFR Part 52, Appendix D, Section VIII. B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.b. The questions below address the criteria of B.5.b.

1. Does the proposed departure result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

The changes described will not increase the frequency of occurrence of an accident because there is no significant increase in the probability of failure of the safety functions due to the design changes.

2. Does the proposed departure result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

   There are no changes which will cause an increase in the probability of an occurrence of a malfunction of any SSC important to the safety and previously evaluated in the plant specific DCD.

3. Does the proposed departure Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

   The changes have no effect on the operation, performance, and pressure boundary integrity of the containment vessel. Therefore, there is no increase in the calculated release of radioactive material during postulated accident conditions.

4. Does the proposed departure result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

   The changes have no effect on the design functions or reliability of an SSC. Therefore there is no increase in the calculated release of radioactive material due to a malfunction of an SSC.

5. Does the proposed departure create a possibility for an accident of a different type than any evaluated previously in the plant-specific DCD? ☐ YES ☒ NO

   The changes have no effect on the operation, performance and pressure boundary integrity of the containment vessel. The changes do not introduce any additional failure modes. Therefore, these changes will not result in an accident of a type different than what has already been evaluated in the DCD.

6. Does the proposed departure create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific DCD? ☐ YES ☒ NO

   The changes have no effect on the design functions of an SSC. Therefore, there are no additional failure modes or the possibility for a malfunction of an SSC important to safety with a different result than evaluated previously.

7. Does the proposed departure result in a design basis limit for a fission product barrier as described in the plant-specific DCD being exceeded or altered? ☐ YES ☒ NO

   There is no change to the design function of an SSC. Therefore, the proposed departure result does not result in a design basis limit for a fission product barrier as described in the plant-specific DCD being exceeded.

8. Does the proposed departure result in a departure from a method of evaluation described in ☐ YES ☒ NO

the plant-specific DCD used in establishing the design bases or in the safety analyses?

The methods of evaluation for the SSCs described in the plant-specific DCD are not altered by the proposed departure.

☒ The answers to the evaluation questions above are "NO" and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.b

☐ One or more of the answers to the evaluation questions above are "YES" and the proposed change requires NRC review.

D. IMPACT ON RESOLUTION OF A SEVERE ACCIDENT ISSUE

10 CFR Part 52, Appendix D, Section VIII. B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.c. The questions below address the criteria of B.5.c.

1. Does the proposed activity result in an impact to features that mitigate severe accidents. If the answer is Yes answer Questions 2 and 3 below. ☐ YES ☒ NO

2. Is there is a substantial increase in the probability of a severe accident such that a particular severe accident previously reviewed and determined to be not credible could become credible? ☐ YES ☐ NO ☒ N/A

3. Is there is a substantial increase in the consequences to the public of a particular severe accident previously reviewed? ☐ YES ☐ NO ☒ N/A

☒ The answers to the evaluation questions above are "NO" or are not applicable and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.c

☐ One or more of the he answers to the evaluation questions above are "YES" and the proposed change requires NRC review.

E. SECURITY ASSESSMENT

1. Does the proposed change have an adverse impact on the security assessment of the AP1000. ☐ YES ☒ NO

The design changes will not alter barriers or alarms that control access to protected areas of the plant. The changes will not alter requirements for security personnel.