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Your ref: Project Number 740  
Our ref: DCP/NRC2000

September 19, 2007

Subject: AP1000 COL Response to Requests for Additional Information (TR 106)


In support of Combined License application pre-application activities, Westinghouse is submitting responses to the NRC requests for additional information (RAIs) on AP1000 Standard Combined License Technical Report 106, APP-GW-GLN-106, AP1000 Licensing Design Changes for Mechanical System and Component Design Updates. These RAI responses are submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in the responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification.

Responses are provided for RAI-TR106-SEB1-01 through RAI-TR106-SEB1-04, transmitted in an email from Dave Jaffe to Sam Adams dated August 16, 2007. These are the first four responses to seven total requests received to date.

Pursuant to 10 CFR 50.30(b), the responses to the requests for additional information on Technical Report 106, are submitted as Enclosure 1 under the attached Oath of Affirmation.

Questions or requests for additional information related to the content and preparation of these responses 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 and Customer Interface  
Regulatory Affairs and Standardization

/Attachment

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

/Enclosure

1. Responses to Requests for Additional Information on Technical Report No. 106

cc:	D. Jaffe	- U.S. NRC	1E	1A
	E. McKenna	- U.S. NRC	1E	1A
	G. Curtis	- TVA	1E	1A
	P. Hastings	- Duke Power	1E	1A
	C. Ionescu	- Progress Energy	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
	P. Fehring	- Westinghouse	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 )

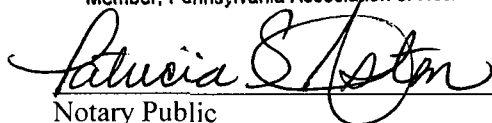
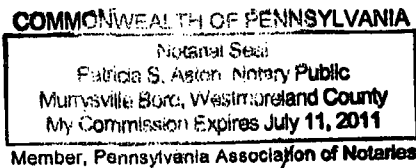
APPLICATION FOR REVIEW OF  
"AP1000 GENERAL COMBINED LICENSE INFORMATION"  
FOR COL APPLICATION PRE-APPLICATION REVIEW

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.



B. W. Bevilacqua  
Vice President  
New Plants Engineering

Subscribed and sworn to  
before me this 19<sup>th</sup> day  
of September 2007.



Notary Public

ENCLOSURE 1

Responses to Requests for Additional Information on Technical Report No. 106

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-TR106-SEB1-01  
Revision: 0

### **Question:**

Item 2.a, "CA" is not defined. Also the Applicant should state the differences in mechanical properties, such as yield and ultimate strengths, between the Nitronic stainless steel plate, which was used in the DCD, and the Duplex 2101 stainless steel, which is used in the design change. Since the stress-strain curve (relationship) of one type of steel is usually different from another type of steel, state whether the CA structural modules in the DCD has been redesigned due to the steel material strengths or stress-strain curves change. If the answer is no, provide justifications.

### **Westinghouse Response:**

- The AP1000 design uses a series of project locator codes available in Level 3 AP1000 Quality Assurance Procedure APP-GW-GMP-005, Revision 2, "AP1000 Document Numbering Procedure." CA modules are defined as Large Structural (Concrete Filled in Place) Modules.

- Yield strength information is provided below:

Nitronic 33	55 ksi
Duplex 2101	65 ksi

- The material was changed (to Duplex 2101 with higher yield strength) because Nitronic 33 was not available in width required for CA01 and CA20 modules. Re-analyses are being performed with material properties of Duplex 2101 to assure that structures are adequate.

### **Reference:**

1. APP-GW-GMP-005, Revision 2, "AP1000 Document Numbering Procedure."

### **Design Control Document (DCD) Revision:**

None

### **PRA Revision:**

None

### **Technical Report (TR) Revision:**

None



# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-TR106-SEB1-02

Revision: 0

### **Question:**

Item 2b states that "The AP1000 cask handling crane design was neither seismically qualified, nor single failure proof (SFP) to protect against dropping a cask. This event could cause significant plant damage, therefore a design change was initiated to upgrade the cask handling crane to SFP." The staff commends your finding out of this mistake in the AP1000 DCD and concurs with your assessment that the mistake could cause significant plant damage. The staff agrees with your upgrading the cask handling crane to SFP. Since the cask handling crane is an obvious seismic Category I equipment (structural member) and many cask handling cranes in operating plants have been upgraded to SFP, the staff is troubled by the fact that the AP1000 cask handling crane was designed without considering seismic loads and SFP. The staff's concern is whether the AP1000 DCD still contains similar types of mistakes in other structural members. Therefore, the staff requests that the applicant provide methods and procedures to unearth and correct the rest of the mistakes, if any, in the AP1000 DCD.

### **Westinghouse Response:**

The AP1000 spent fuel cask handling crane design was intentionally designed not to be seismically qualified and not include single-failure protection against dropping the cask. This design basis was consistent with the URD and a heavy-loads analysis was performed (for AP600) in accordance with NUREG-0612 and US NRC Generic letter 81-07. This analysis concluded that a spent fuel cask drop could not result in direct damage to the spent fuel or significant damage to the spent fuel pool since the cask crane travel was limited, and that the safety related piping paths for the addition of water to the pool from the passive containment cooling water storage tank (PCCWST) or ancillary tank (PCCAWST) would not be affected.

While a dropped cask does not result in the complete loss of spent fuel cooling capability, this event could cause significant plant damage. Westinghouse recommended that the single-failure proof cask crane design be adopted for the standard AP1000 plant. Designing the AP1000 cask crane to be seismically qualified and to have a single failure proof main hoist is relatively inexpensive and appears to have no adverse impact on the required crane clearances. The decision to upgrade the AP1000 cask crane design was accepted and encouraged by NuStart Utilities.

Westinghouse Electric Company continues to implement quality procedures and practices per the Westinghouse Quality Management System (QMS) that are in accordance with the requirements of ISO 9001:2000 and ISO 9000-3:1997; and in addition, as applicable for safety-related activities, 10CFR50, Appendix B; ASME NQA-1-1994 Edition; and IAEA 50-C-QA, Revision 1. The Westinghouse Quality Management System is audited by the NRC.

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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**Design Control Document (DCD) Revision:**  
None

**PRA Revision:**  
None

**Technical Report (TR) Revision:**  
None



# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-TR106-SEB1-03  
Revision: 0

### **Question:**

According to statements in Item 2.f and 9.1.1.2.1C, the bounding new fuel assembly drop load has been increased to 2,027 pounds from the magnitude of 1,875 pounds as listed in DCD, Revision 15. For the two postulated accident conditions, 9.1.1.2.1C states that analysis and calculations will be performed to demonstrate that the increase drop load will not impair the structural integrity of the fuel assembly, the rack cells, and the rack base plate assembly and the resulting rack deformation will not violate criticality criteria. Indicate when these analyses and calculations will be performed. The staff finds that 9.1.1.2.1C did not describe whether the structural integrity of steel liners for the spent fuel pool structure will be impaired or not as the result of the fuel assembly load drop, and, therefore, requests the applicant to address this issue.

### **Westinghouse Response:**

TR-44 New Fuel Storage Rack Structure/Seismic Analysis Rev. 0 (Westinghouse Report APP-GW-GLR-026, Rev 0) was submitted to the NRC last Summer. This analysis did factor in the 2,027 lb weight so the calculation was completed and no reanalysis is necessary. Westinghouse also prepared TR-67 New Fuel Rack Criticality Analysis (Westinghouse Report APP-GW-GLR-030, Rev 0). This report evaluated criticality aspects of the drop accidents at the 2,027 weight. The report concluded that all criticality criteria were met. This report was reviewed by the NRC. The NRC also reviewed the Westinghouse calculation (APP-FS01-N1C-001) at the Westinghouse Rockville Office which formed the basis for the technical report.

Westinghouse will provide an analysis of the impact to the Spent Fuel Pool liner and floor from a dropped fuel assembly by January 15, 2008.

### **Design Control Document (DCD) Revision:**

None

### **PRA Revision:**

None

### **Technical Report (TR) Revision:**

None

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-TR106-SEB1-04  
Revision: 0

### **Question:**

The staff finds that Item 4, "The spent fuel shipping cask crane cannot move over the spent fuel pool." was deleted from AP1000 DCD Tier 1, Section 2.3.5, Mechanical Handling System, Design Description, without mentioning the deletion in this submittal. State the basis for deleting this sentence and the reason for not mentioning it.

### **Westinghouse Response:**

The statement in question was not removed from the AP1000 Design Control Document nor does the TR propose that it be removed. The statement in question remains unchanged between revision 15 and 16 of the DCD. The mark-up of Section 2.3.5 as shown in TR 106 is intended to show what has changed and is not meant to be a direct copy of the entire section from the DCD.

**Design Control Document (DCD) Revision:**  
None

**PRA Revision:**  
None

**Technical Report (TR) Revision:**  
None