Docket File

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 7, 1997

52-3

Mr. Nicholas J. Liparulo, Manager
Nuclear Safety and Regulatory Activities
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
P.O. Box 355
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SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION (RAI) AND OPEN ITEM (OIs) STATUS ON THE AP600 ADVANCED REACTOR DESIGN IN THE CIVIL ENGINEERING AND GEOSCIENCES BRANCH (ECGB) REVIEW AREAS

Dear Mr. Liparulo:

The Nuclear Regulatory Commission's (NRC) ECGB staff has determined that it needs additional information in order to complete its review of the Westinghouse AP600 advanced reactor design. Enclosure 1 is (RAI# 231.34 and 210.227-210.231) regarding standard safety analysis report descriptions in two ECGB review areas. Enclosures 2 through 6 are updates to the OIs in several civil, mechanical, and structural engineering review areas.

You have requested that portions of the information submitted in the June 1992 application for design certification be exempt from mandatory public disclosure. While the staff has not completed its review of your request in accordance with the requirements of 10 CFR 2.790, that portion of the submitted information is being withheld from public disclosure pending the staff's final determination. The staff concludes that these questions and comments do not contain those portions of the information for which exemption is sought. However, the staff will withhold this letter from public disclosure for 30 calendar days from the date of this letter to allow Westinghouse the opportunity to verify the staff's conclusions. If, after that time, you do not request that all or portions of the information in the enclosures be withheld from public disclosure in accordance with 20 CFR 2.790, this letter will be placed in the NRC Public Document Room.

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If you have any questions regarding this matter, you may contact me at (301) 415-8548.

Sincerely,

original signed by:

Diane T. Jackson, Project Manager
Standardization Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No. 52-003

Enclosures:
1. Requests for Additional Information
2. Update to Open Items in SSAR Sections 3.2, 3.6.2, 3.9 and 3.10
3. Update to Open Items in SSAR Section 3.6.3
4. Update to Open Items in SSAR Sections 3.7 and 3.8
5. Update to Open Items in SSAR Sections 3.9.2, 3.9.5 and 3.9.7
6. Update to Open Items in SSAR Section 3.9.6
7. Update to Open Items in SSAR Section 3.12
8. Update to Open Items in PRA Chapter 42

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Westinghouse Electric Corporation

Docket No. 52-003
AP600

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Requests for Additional Information

Chapter 2

1. RAI 231.34 - Site Design Parameters
Action W

Westinghouse uses the term "interface requirements" in SSAR Section 2.2 and Subsection 2.5.2.1 and "site interface criteria" in SSAR Subsection 2.5.4.5. This terminology is unacceptable. Westinghouse should use "site parameter" or "site design parameter," in accordance with 10 CFR 52.47(a)(iii) and past practice on the Advanced Boiling Water Reactor (ABWR) and System 80+ designs. Interface requirements are different than site parameters as distinguished in 52.47(a). Westinghouse is requested to review its SSAR, particularly those sections cited above, and revise it accordingly.

SSAR Section 3.9.6 - Inservice Testing (IST) Issues

Based on the review of AP600 SSAR (Rev. 10) and Westinghouse letter responses to IST questions dated 12/17/96, the staff finds that the following issues are need to be resolved to complete the review. To close these issues, additional SSAR revisions are required as discussed in the telephone conference on January 31, 1997 and described below:

2. RAI 210.227 - SSAR 3.9.6 (IST)
Action W

Revise the SSAR to reflect correct reference of OM Standards, OMa-1988 or the 1990 Edition of the OM Codes. From the January 31, 1997, telephone conference, Westinghouse will send a letter requesting an exemption and revise the SSAR accordingly.

3. RAI 210.228 - SSAR 3.9.6 (IST)
Action W

The main feedwater (FW) check valves, SGS-V058A/B appear to have a safety function to close based on SSAR Subsection 10.4.7.1.1. Revision 10 still indicates that these valves have a safety-related function, but they are not included in the ISTP (IST Program). In the January 31, 1997, telephone conference, Westinghouse stated that these valves do not perform a safety function and will move the FW check valve description from SSAR Subsection 10.4.7.1.1 to SSAR Subsection 10.4.7.1.2.

4. RAI 210.229 - POV Test - SSAR 3.9.6 (IST)
Action W

NRC issued Generic Letter (GL) 96-05 on periodic verification of MOVs. Westinghouse should revise WCAP-13559 to reflect implementation of this

generic letter. Based on these documents, SSAR Subsection 3.9.6.2 should be revised to comply with staff guidance. This issue is related to Open Item Tracking System (OITS) Item Nos. 798, 800, 810 and 811. SSAR 3.9.6.2.2 should be revised to state that for POV test, where practical, the test will be performed under full flow with actual plant conditions. From the January 31, 1997, telephone conference, Westinghouse will review the GL and propose a resolution.

5. RAI 210.230 - Safety Relief Valve Test - SSAR 3.9.6 (IST)
Action W

The SSAR (Rev. 10) was revised to include "5 years and 20% in 2 years. For Class 2/3, the SSAR should be revised for consistency to include "10 years and 20% in 4 years." From the January 31, 1997, telephone conference, Westinghouse will revise the SSAR.

6. RAI 210.231 - SSAR 3.9.6 (IST)
Action W

The discussion of Issue 87 in SSAR Section 1.9 should be revised to state that valves built to Section III are required to be tested in accordance with the ASME Code. Revision 10 still states that these valves may be tested in accordance with the OM Code. From the January 31, 1997, telephone conference, Westinghouse will revise the SSAR.

Status of ECGB DSER Open Items in Mechanical and Structural Engineering Scopes of Review (through SSAR Rev. 10)

Issues in SSAR Sections 3.2, 3.6.2, 3.9, & 3.10

1. Open Item 3.2.1-1 (OITS 562) - Appendix B for Seismic Category II
   Action W

The resolution of this issue is pending the staff's evaluation of responses to RAIs 260.83 and 260.87.

2. Open Item 3.2.1-2 (OITS 563) - Appendix B for fuel storage racks
   Action W

The resolution of this issue is pending the staff's evaluation of responses to RAIs 260.88 and 260.89.

3. Open Item 3.2.2-1 (OITS 564) - Classification of Emergency Core Cooling System (ECCS)
   Action W

In a letter to Westinghouse dated August 20, 1996, this open item was reported by the staff as being resolved. However, before this issue is considered resolved, the staff needs the following information and/or clarifications in the SSAR:

a. The staff has identified the components and systems listed below as part of ECCS systems that are classified as AP600 Class C (ASME Class 3):

- In-containment refueling water storage tank (SSAR Fig. 6.3-2)
- Accumulator (SSAR Fig. 6.3-1)
- Accumulator injection piping to discharge check valve V-028 (SSAR Fig. 6.3-1)
- Containment recirculating piping and valves to in-containment refueling water storage tank (IRWST) injection check valve V-122 (SSAR Fig. 6.3-1)
- Piping from 1st, 2nd & 3rd stage automatic depressurization valves (ADV) to the IRWST, including depressurization spargers (SSAR Fig. 5.1-5 & 6.3-2)

Westinghouse is requested to verify in the SSAR Subsection 3.2.2.5, that all of the above components and systems and any other Class 3 ECCS not listed above are included in the commitment to random radiography for all ECCS.

b. It appears that SSAR Subsection 3.2.2.5 is the only place in the SSAR that contains the above commitment. Since this commitment is not stated in either Table 3.2-3 or applicable P&IDs, how can the staff be assured that it will be implemented on all AP600 plants?

4. RAI 210.216 (OITS 3506) - Main Control Room Habitability System Tanks
Resolved

5. RAI 210.217 (OITS 3507) - Table 3.2-3, Compressed and Instr. Air System
Resolved

Resolved by Revision 10 to SSAR, Figure 9.3.1-1.

6. RAI 210.218 (OITS 3508) - Table 3.2-3, Demineralization Water Transfer & Storage System
Resolved

Resolved by Revision 10 to SSAR, Figure 9.3.2-4.

7. RAI 210.219 (OITS 3509) - Table 3.2-3, Passive Cont. Cooling System
Action N

The response to this issue in the letter dated December 2, 1996, is being evaluated by the staff.

8. RAI 210.220 (OITS 3510) - Table 3.2-3, Primary Sampling System
Resolved

Resolved by Revision 10 to SSAR, Figure 9.3.3-1.

9. RAI 210.221 (OITS 3512)- Table 3.2-3, Reactor System
Action W

Revision 10 to the SSAR, Table 3.2-3 provides acceptable responses to RAI 210.221a through d. However, the response to 210.221a is not acceptable. This portion of the RAI requested the basis for the Core Barrel Nozzle to be Class D and non-seismic when the Core Barrel is Class B and Seismic Category I. In a letter dated December 2, 1996, the response to this request states that the seismic classification of the nozzle would be changed to Category II, and the safety classification would remain as Class D because the nozzle does not provide core support and does not have to be safety-related. The staff's position is that the nozzle is an integral part of the core barrel (which is a safety-related component), and therefore should have the same safety and seismic classifications as the barrel. Table 3.2-3 should be revised to change the nozzle to be AP600 Class B and Seismic Category I. Therefore, OITS 3512 remains open.

10. RAI 210.222 (OITS 3513) - Table 3.2-3, Steam Generator System
Resolved

Resolved by Revision 10 to SSAR Table 3.2-3, sheet 47.

11. RAI 210.223 (OITS 3514) - Table 3.2-3, Central Chilled Water System
Resolved

Resolved by Revision 10 to SSAR Figure 9.2.7.1.

12. RAI 210.224 (OITS 3515) - Table 3.2-3, Liquid Radiation Waste System
Resolved

Resolved by Revision 10 to SSAR Figure 11.2-2.

13. Open Item 3.6.2-1 (OITS 592) - Subcompartment Design
Action W

The response to this issue in the letter from McIntyre to Quay dated October 23, 1996, does not appear to contain the detailed information requested by the staff during the review meeting with Westinghouse on July 25 & 26, 1995. As stated in the DSER, Section 3.6.2, page 3-94, the staff's position is that a minimum subcompartment pressure which bounds the effects of a high energy pipe break (with consideration of leak-before-break (LBB) acceptance) must be determined. Specifically, the staff requests that for all subcompartments both inside and outside containment, SSAR Subsections 3.8.3.5 and 3.8.4.3.1.4 be revised to state that those compartments containing high energy piping are designed to the worst case of either the 5 psi load (the 7.5 psi load for the CVS room) or the double ended pipe rupture of the applicable high energy pipe.

14. RAI 210.225 (OITS 3516) - Table 3.6-2, Subcompartments and Postulated Pipe Ruptures
Resolved

Resolved during a telephone conference with Westinghouse on August 29, 1996.

15. RAI 210.40 (OITS 3702) - Break Exclusion in Steam Generator (SG) Blowdown, Startup FW, and Chemical and Volume Control System (CVS) Lines
Action W

In a letter from McIntyre to Quay dated October 23, 1996, and in the OITS 3702 report, Westinghouse states that additional information on the startup line, including the isometric drawings will be provided during a forthcoming meeting with the staff. This issue will be discussed during the next meeting or a telephone conference.

In addition, Revision 10 to SSAR Subsection 3.6.2.1.1.4 added portions of the Chemical and Volume Control System (CVS) to the list of break exclusion areas. These new areas include makeup piping from containment to the anchors upstream of the outside isolation valve and downstream of the inside isolation valve, including branch connections. Revision 10 did not revise SSAR Figure 3E-5 to identify these areas. Therefore, the staff requests more information relative to the exact location of the anchors, the length of piping from the inside and outside isolation valves to each anchor, and the location and lengths of all applicable branch lines.

16. Open Item 3.6.2.3-1 (OITS 595) - Break Locations and Stress Summary
Action N

In Revision 10 to the SSAR contains a significant revision to Subsection 3.6.2.5 which provides additional information on the pipe break hazard analysis. The staff's preliminary evaluation of this submittal resulted in the following request:

As discussed under Open Item 3.6.2.3-5 (OITS 599) below, Westinghouse has submitted a revision to SSAR Subsection 3.6.1.3.2 which refers to the pipe rupture hazards analysis. In addition to the information in Revision 10, (1) add a reference in SSAR Subsection 3.6.2.5, to the new information in Subsection 3.6.1.3.2 that is applicable to the hazards analysis, and (2) in Subsection 3.6.4.1, state that the as-built reconciliation of the hazards analysis will be in accordance with the criteria in SSAR Subsections 3.6.2.5 and 3.6.1.3.2.

17. Open Item 3.6.2.3-2 (OITS 596) - Environmental Qualification
Resolved

18. Open Item 3.6.2.3-5 (OITS 599) - Separating Structures
Action W

In Revision 10 to SSAR Subsection 3.6.1.3.2, information was added which provides a basis for resolving this issue as a part of the pipe rupture hazards analysis. Based on a preliminary review of this submittal, the staff has no further requests for information except to repeat the request in this open item to delete the exception to the standard review plan (SRP) Section 3.6.2 BTP MEB 3-1, Section B.1.c.(4) in WCAP-13054, Revision 2.

19. Open Item 3.9.2.1-1 (OITS 780) - Scope of Preoperational Piping Tests
Resolved

In a letter from McIntyre to Quay dated October 23, 1996, Westinghouse submitted a response to this open item which states that the only systems that meet the criteria in SSAR Subsection 3.9.2.1 are the control room habitability system (VES) and the hot water heating system (VYS). The VES is not subjected to vibration due to low flow rates, and the VYS is not a safety-related

system. Therefore, neither of these systems is applicable to the Chapter 14 "Initial Test Program." Revision 10 added a paragraph to SSAR Subsection 14.2.9.1.7 to provide this information. The staff has concluded that, based on this response, these systems need not be in the initial test program. Therefore, this issue is resolved.

20. Open Item 3.9.3.1-5 (OITS 790) - Intersystem loss of coolant accident (ISLOCA) Criteria
Action N

SSAR Revision 7 added a new paragraph in Subsection 1.9.5.1 which references SSAR Subsection 5.4.7 for design features which are applicable to the ISLOCA for the normal RHR system (RNS) only. The design criteria in SSAR Subsection 5.4.7.2.2 agrees with the staff's position on this issue which is discussed in the DSER, Section 3.9.3, and is acceptable for the RNS. However, as mentioned in DSER Section 3.9.3, if the staff's evaluation of DSER Open Item 20.3-14 (which is discussed in detail in DSER Section 20.3 under Issue 105) results in additional AP600 systems being applicable to the ISLOCA issue, the staff's position will be that this same criteria should apply to those systems. In addition, the staff's preliminary review of the AP600 Technical Specifications resulted in a concern relative to the deletion of leak testing of the reactor coolant system (RCS) pressure isolation valves (PIV), which is related to the intersystem LOCA issue. The staff's concern on the Technical Specifications is discussed in Item 24 of a letter from Huffman to Liparulo dated December 24, 1996. The use of Appendix J containment leakage testing in lieu of applicable Technical Specifications PIV leak testing requirements is not acceptable.

21. Open Item 3.9.3.1-6 (OITS 791) - Heating, Ventilation and Air Conditioning (HVAC) Ductwork Design Criteria
Action N

This issue is included as a part of the staff's review of SSAR Section 3.8.

22. Open Item 3.9.3.3-1 (OITS 792) - Snubber Criteria
Resolved

In a letter from McIntyre to Quay dated October 23, 1996, Westinghouse proposes a revision to SSAR Subsection 3.9.3.4.3 to add a commitment to include dynamic testing as a part of the qualification tests for snubbers. This agrees with the staff's request, and is acceptable. Therefore, this item is resolved pending formal revision of the SSAR. Revision 10 does not contain this commitment.

23. Open Item 3.9.3.3-2 (OITS 793) - Anchor Bolts for Pipe Supports
Action W

In a letter from McIntyre to Quay dated October 23, 1996, Westinghouse responded to this item by referencing Revision 9 to SSAR Subsection 3.9.3.4. Revisions 9 and 10 contain no change to this portion of Subsection 3.9.3.4. It still commits only to the baseplate flexibility requirements of IE Bulletin 79-02 and is silent on the factors of safety for concrete expansion anchor bolts. Since the factor of safety issue is being evaluated by the staff under DSER Open Item 3.8.4.2-2, Subsection 3.9.3.4 should contain a reference to the applicable portion of SSAR Subsection 3.8.4 for information relative to these factors of safety.

24. Open Item 3.10-1 (OITS 813) - Use of Seismic Experience Data
Action W

Revision 10 to SSAR Section 3.10.6 states that the COL applicant, as a part of the Combined License application, will identify equipment qualified based on experience and include details of the methodology and the corresponding experience data. This agrees with the staff's request on this item, and is acceptable. However, the exception to SRP 3.10 in Revision 2 to WCAP-13054 contains statements which either need to be deleted or clarified. The first two sentences imply that IEEE 344-1987 is acceptable relative to the use of experience data. Regulatory Guide (RG) 1.100, Revision 2 states that this method of qualification in IEEE 344-1987 will be evaluated by the staff on a case-by-case basis. It appears to the staff that the exception in the WCAP is relative to RG 1.100, Revision 2. These two sentences should be revised to reflect the position in RG 1.100, Rev. 2. In addition, the discussion relative to Generic Issue A-46 is not applicable to new plants. The staff's position is that A-46 is only used for verification of equipment in operating plants, and is not acceptable for qualification of equipment in advanced light water reactors (ALWRs). This discussion should either be deleted or revised.

25. Open Item 3.10-2 (OITS 814) - Dynamic Analysis of Valve Disks
Action W

In Revision 10 to the SSAR, Westinghouse responded to this item by revising the fourth paragraph of Subsection 3.10.2.2 to state that feedwater line valve disks are evaluated for the effect of dynamic loads of pipe breaks by considering the effect of an equivalent differential pressure. This does not appear to address the staff's concerns. The staff considers equivalent differential pressure as being a static load. The SSAR should be revised to describe the methodology used in the AP600 design to analyze the dynamic closure of feedwater line valve disks when they are subjected to dynamic loads due to a pipe break.

26. Open Item 3.10-3 (OITS 815) - Reactor Coolant Pressure Boundary (RCPB) Valve Leakage per SRP 3.10
Resolved

Revision 5 to the SSAR revised Subsection 3.10.2.2 to provide an acceptable response to this item. In addition, WCAP 13054, Revision 2 revised page 3-68 to provide an acceptable comment. Therefore, this item is resolved.

27. Open Item 3.10-4 (OITS 816) - Aging by Analysis
Resolved

Revision 5 to the SSAR revised Appendix 3D to commit to the staff's position to use IEEE 323-1974 rather than the 1983 Edition. Revision 2 of WCAP 13054 revised the "exception" to SRP 3.10.II.1.c to "acceptable." Therefore, this item is resolved.

Status of Open Items in SSAR Section 3.6.3 - Leak-Before Break

1. DSER #3.6.3.4-1 (OITS 608) - LBB Bounding Analysis
   Action W/N

- Add a description in SSAR 3B.3.1.3 and 3B.3.2.3 (bounding curve construction procedures), or in 3.6.3.3 (bounding analysis) to explain how bounding curves meet LBB acceptance criteria.

- NRC will audit calculations to ensure that the bounding curves satisfy LBB acceptance criteria.

- Uncertainties in applying LBB to small lines (see NUREG/CR-6443, Section 3.5 on pressure-induced bending effects to leakage flaw size and max stress) needs to be discussed. Westinghouse should perform sensitivity studies.

- Applying the LBB methodology to the FW line is unacceptable. Revisions to the SSAR to delete the main feedwater line from LBB consideration will be tracked under DSER# 3.6.3.5-5 (OITS 614). For further discussion of this issue, see NRC letter dated January 24, 1997.

- Results from the PICEP computer code do not agree with Westinghouse LBB analyses. Need an explanation.

2. DSER# 3.6.3.4-2 (OITS 609) and COL Action Item 3.6.3.4-1 (OITS 1883)
   Resolved

Newly revised SSAR Section 3.6.4.2 (Revision 10) is acceptable. COL applicant to verify LBB bounding analyses on materials, as-built analyses, and acceptance parameters. Thus, DSER Open Item 3.6.3.4-2 and DSER COL Action Item 3.6.3.4-1 (OITS 1883) are resolved.

3. DSER# 3.6.3.5-1 (OITS 610) - Leak detection methods (RAI 252.8)
   Action N

Changes in SSAR Subsection 5.2.5.3.1, Rev.10 regarding containment sump level monitor is under staff review.

4. DSER# 3.6.3.5-2 (OITS 611) - Class 1 vs. Class 2 differences in analysis, fabrication, and inspection - RAI 252.5
   Action W

Explain why the fatigue crack growth analyses and augmented in-service inspection (ISI), which are performed for the feedwater nozzle connections to steam generator, are not performed at the main steam nozzles. Revision of SSAR Sections 3B.2.4, and 3B.8, Rev 10 may be needed.

Enclosure 3

5. DSER# 3.6.3.5-3 (OITS 612) - Location of MS and Feedwater (FW) anchors
Resolved

Changes in SSAR Revision 4, Section 3.6.3 paragraph 7 and Appendix 3E identify the scope of LBB analysis for the main steam line, as well as anchor locations. The anchors are to remain at the exterior wall of the auxiliary building. This is acceptable. The Westinghouse proposal to apply LBB methodology to the FW line is unacceptable. Revisions to the SSAR to delete the main feedwater line from LBB consideration will be tracked under DSER# 3.6.3.5-5 (OITS 614).

6. DSER# 3.6.3.5-4 (OITS 613) - MS and FW definitions for LBB (Audit issue)
Resolved

The scope of LBB analysis for the main steam line is consistent due to changes in SSAR Revision 4, Section 3.6.3 paragraph 7 and Appendix 3E. The Westinghouse proposal to apply LBB methodology to the FW line is unacceptable. Revisions to the SSAR to delete the main feedwater line from LBB consideration will be tracked under DSER# 3.6.3.5-5 (OITS 614).

7. DSER# 3.6.3.5-5 (OITS 614) - Justification of LBB for MS and FW - RAI 252.13 (OITS 2422 to 2428)
Action W

The Westinghouse proposal to apply LBB methodology to the FW line is unacceptable. Westinghouse needs to revise the SSAR to delete the main feedwater line from LBB consideration. For further discussion of this issue, see NRC letter dated January 24, 1997.

8. DSER# 3.6.3.6-1 (OITS 615) - Soil conditions for LBB analyses - RAI 210.10
Action N

The NRC staff will audit the LBB bounding analysis to verify critical flaw stability under N+SSE loading, and to verify acceptability of bounding curves under limiting load conditions.

9. DSER# 3.6.3.6-2 (OITS 616) - Staff piping design review - RAI 252.11
Action W

This item will be evaluated as a part of DSER Open Item 3.6.3.4-1.

10. DSER# 3.6.3.6-3 (OITS 617) - 0.5 gpm vs. 1.0 gpm leakage rate
Resolved

To resolve this issue, the following criteria were incorporated into the SSAR: (1) capability to monitor 0.5 gpm leak rate is demonstrated, (2) using

absolute sum combination of normal and SSE load with load factor of 1.0, and (3) using a factor of two between critical crack length under normal plus SSE and the leakage crack length under normal load.

11. DSER# 3.6.3.6-4 (OITS 618) - Leakage rate evaluation methodology
Action W

This issue will be evaluated as a part of DSER Open Item 3.6.3.4-1.

12. DSER# 3.6.3.6-5 (OITS 619) - Justification of the part-through flaw criterion
Resolved

In SSAR Section 3.6.3.3, Revision 4, the part-through flaw criterion was deleted. This is acceptable.

13. DSER# 3.6.3.6-6 (OITS 620) - Water hammer-type loads in LBB analyses (Test results issue)
Action W

Preliminary results from small-break LOCA tests performed at Oregon State University indicate that rapid condensation events have the potential to cause unanticipated dynamic loads to occur in the AP600 RCS. These water hammer type loads have not been considered in the piping design loads to justify a LBB approach for the AP600 main coolant loop and attached piping. Westinghouse was requested to address whether these water hammer-type loads from condensation events need to be considered in its LBB analyses or, if not, justify why these loads can be excluded and incorporate relevant discussions in the SSAR.

14. Meeting Open Item (OITS 2422)
Resolved

The Westinghouse proposal to apply LBB methodology to the FW line is unacceptable. Revisions to the SSAR to delete the FW line from LBB consideration will be tracked under DSER# 3.6.3.5-5 (OITS 614).

15. Meeting Open Items (OITS 2423 - 2429)
Action N

The Westinghouse proposal to apply LBB methodology to the FW line is unacceptable. Westinghouse needs to revise the SSAR to delete the FW line from LBB consideration. Revisions to the SSAR to delete the FW line from LBB consideration will be tracked under DSER# 3.6.3.5-5 (OITS 614). The staff will complete the review of concerns, other than the FW line, in these open items during the closure of DSER# 3.6.3.4-1.

Major Issues Remaining from the Reviews of
SSAR Sections 3.7 and 3.8 - Civil and Structural Engineering

1. DSER Open Item 3.7.1.1-1 (OITS 628) Inclusion of Shallow Soil Site in the AP600 Standard Plant Design
Action W

The AP600 standard seismic design parameter is 0.3g peak ground acceleration with the response spectra shown in Figures 3.7.1-1 and 2.

The staff has reviewed the standard safety analysis report (SSAR), Revision 9. In SSAR Subsection 2.5.4.5.5, "Response of Soil and Rock to Dynamic Loading," Westinghouse states that for sites where the soil characteristics are outside the range considered in Appendix 2B.2 of the SSAR, site-specific soil-structure interaction analyses may be performed by the Combined Operating License (COL) applicant to demonstrate acceptability and that the analysis would use the site-specific soil conditions and site-specific safe shutdown earthquake. NRC staff has discussed this issue in the past and determined that this proposal was unacceptable. See NRC letter dated January 31, 1997, for further discussion on this issue. Westinghouse needs to revise the SSAR.

2. DSER Open Item 3.7.2.8-5 (OITS 662) Use of "X" Type Concentric Bracing Systems for the Design of Turbine Building
Action W

In the SSAR, Westinghouse proposed to use the "X" type concentric bracing system together with the Uniform Building Code (UBC) requirements for the design of turbine building. Based on a series of test performed at the earthquake engineering research center of University of California at Berkeley, a steel frame structure with concentric bracing designed based on UBC requirements will result in a nonconservative design. To resolve this issue, the following three options were provided to Westinghouse:

a. The SSAR could commit to the eccentric bracing systems together with the same design requirements in stead of the "X" type concentric bracing systems for the design of the turbine building.

b. Westinghouse could provide test data by the industry to demonstrate that the "X" type concentric bracing systems designed for UBC requirements will not fail or collapse in the event of an SSE

c. Westinghouse could demonstrate by analysis to show that the collapse of the turbine building will not impair the integrity of seismic Category I structures, systems or components.

Westinghouse must revise the SSAR based on the option it decides to incorporate.

3. DSER Open Item 3.7.2.12-1 (OITS 668) Use of the Response Spectrum analysis and Time History Analysis Method for the Seismic Design
Action W

In Revision 9 of SSAR Section 3.7.2.12, Westinghouse stated that the 3D lumped mass fixed-base stick model of the nuclear island was analyzed by modal superposition time history analysis and by the response spectrum analysis method for the hard rock site condition. The staff's review found that the maximum absolute nodal accelerations calculated by the response spectrum analysis are consistently higher than those from the modal superposition time history analysis. At some locations, the accelerations from these analyses are deviated by 30 percent in the East-West direction and 40 percent in the vertical direction. The staff's concern is that if the maximum nodal accelerations calculated by modal time history analyses are always lower than those obtained from response spectrum analyses, it implies that the floor response spectra generated based on the floor time histories may not be conservative for the design of subsystems such as piping. Westinghouse must justify the adequacy of the final design floor response spectra documented in the SSAR.

4. Open Item 3.8.4.3-1 (OITS 745) Live Load for the Design of Safety Structures
Action W

As described in the SSAR and the civil/structural design criteria for AP600, Westinghouse committed that the operating live load is the only live load to be considered in the seismic analysis. The criteria also state that for nuclear island structures, 25-percent of the maximum live load shall be used to represent the operating live load portion to be included in the seismic load for local member design. The inclusion of 25-percent of the maximum live load to represent the operating live load portion of seismic loads is not acceptable. In addition, the SSAR did not explain how the live load was considered in the dynamic model for calculating seismic responses. Westinghouse's SSAR commitment deviates significantly from the staff position on the application of live load in the seismic design of safety related structures. Westinghouse should (a) revise the SSAR and civil/structural design criteria to make them compatible with the staff position on the treatment of live load, and (b) demonstrate that the final design of structures complies with the revised design criteria.

5. DSER Open Item 3.8.4.4-2 (OITS 750) Design of the Shield Building Roof Structures
Action W

During the design calculation review conducted on December 9 through 13, 1996, the staff identified that the torsional moment due to the combined loads applied on the tension ring beam is significantly lower than that obtained from the staff's confirmatory analysis. Westinghouse should either justify the adequacy of the originally calculated torsional moment or perform a new analysis to calculate the torsional moment for the design.

6. Open Item 3.8.5-9 (OITS 767) Design Adequacy of the 6-Foot Foundation Mat for the Nuclear Island Structures
Action W

Because of the thinness of the nuclear island basemat (6 feet thick), NRC staff has discussed the need for Westinghouse to demonstrate that the basemat is capable of being located at sites with a full range of conditions of soil stiffness variability. It is not acceptable to constrain the basemat design to suit only certain foundation conditions and subject the site suitability determination through an unusual and detailed series of geotechnical investigations to be conducted by the COL applicant.

It should also be pointed out that the thinness of the basemat design requires development of a detailed construction sequence. In other evolutionary designs basemat thickness never became a factor in the construction sequence. Consequently, the thinness of the AP600 basemat would require ITAAC (inspections, tests, analyses and acceptance criteria) verification backed up by a thorough construction inspection program. This is unacceptable. See the NRC letter dated January 31, 1997, for further discussion of this issue.

7. DSER Open Item 3.8.3.3-3 (OITS 719) Design of the IRWST and Internal Structural Steel Frames Under Combination of Automatic Depressurization System (ADS) load and SSE
Action W

There are three concerns addressed in this open item. These three concerns are (a) to consider the combination of the load due to ADS actuation and the SSE load in the IRWST design, (b) to include the thermal load in the design internal structural steel frames, and (c) to include the latest test result (ADS load) in the IRWST design. From the review of design calculations during January 14 through 17, 1997, meeting, Concerns (a) and (c) were resolved. As for Concern (b), Westinghouse failed to provide design calculations for the staff review during the meeting. This open item remains unresolved.

8. DSER Open Item 3.8.3.4-6 (OITS 725) - Effect of Concrete Cracks to the Seismic Model of the Containment Internal Structures
Action W

In addressing the effect of concrete cracks to the seismic model of the Containment internal structures, Westinghouse stated in Revision 7 of the SSAR (Section 3.8.3.4.1.2 and Table 3.8.3-1) that for considering cracks in the concrete fill, the in-plane shear stiffness was calculated based on a 45-degree diagonal concrete compression strut with tensile loads carried by the steel plates. These calculated stiffness are considerably lower than the test data described in SSAR References 27 and 28 where the overall stiffness reduced to 60 to 70 percent of the monolithic stiffness. If the calculated stiffness are used for the boundaries of the in-containment refueling water storage tank, the equivalent shear area of the containment internal structures is reduced by about 30 percent with a corresponding reduction in frequency of

about 16 percent. The staff review of this SSAR revision found that the floor response spectra in the containment internal structures are not acceptable for the following two reasons:

(a) As shown in Revision 7 of SSAR Figures 3.7.1-7 and Table 3.7.2-3, the first dominant frequency of the internal structures in the north-south direction is 13.6 hertz and the corresponding ground spectral acceleration is ±0.63g. If the first dominant frequency reduced from ±13.6 hertz to 11.42 hertz (reduced by 16 percent), the corresponding ground spectral acceleration is increased to ±0.72g. Westinghouse did not consider this ground spectral acceleration increase due to concrete cracks when calculate the floor response spectra in the containment internal structures.

(b) In following the guideline of Regulatory Guide 1.122, Westinghouse developed the final floor response spectra by applying the ±15 percent peak broadening rule to the enveloped floor response spectra to cover the uncertainties due to material properties of structures and soil, soil-structure interaction techniques, and approximations in the modeling techniques. However, the ±15 percent peak broadening cannot cover the uncertainties due to the cracked concrete in the structural modules.

In conclusion, Westinghouse should either regenerate the floor response spectra for the containment internal structures or justify the adequacy of the floor response spectra documented in the SSAR.

9. DSER Open Item 3.8.3.4-11 (OITS 730) Connection Details for Concrete Filled Steel Modules
Action W

During the design calculation review conducted on January 14 through 17, 1997, the staff found that the final design calculation for the connection details of concrete-filled steel modules was not available for the staff review.

10. DSER Open Item 3.8.3.4-13 (OITS 732) - Design Calculations for the Staff Review
Action W

During the January 14-16, 1997 review meeting, the staff found Westinghouse's design calculations to be lacking in clarity and completeness. Westinghouse should conduct its own design review of these calculations to improve their quality and completeness and finalize them before the staff's review.

11. DSER Open Item 3.8.4.4-7 (OITS 755) - Containment Air Baffle Design
Action W

During the January 14 through 17, 1997 meeting, the staff's review of the design calculation for the containment air baffle found that Westinghouse did not consider the loads associated with air flow fluctuation in the design and did not evaluate the potential for air flow-induced vibration/fatigue failure. Westinghouse should include these effects in the final design.

12. DSER Open Item 3.8.5-10 (OITS 768) - Construction loads for the Nuclear Island Foundation Mat Design
Action W

Based on the staff's past licensing review experience and engineering judgement, the unevenly distributed construction loads on the foundation mat, especially for the foundation mat with large dimensions and irregular shape, can be very significant and may cause severe foundation cracks. This open item states that Westinghouse should include the construction loads in the basemat design and provide the design requirement in the SSAR.

In Revision 7 of the SSAR, Westinghouse indicates that the construction sequence-related shears and moments in the basemat around the perimeter of the shield building are included in the foundation mat design. However, in the revised draft SSAR provided in the December 9 through 13, 1996 meeting, Westinghouse changed its position, and stated that the construction sequence-related stresses do not reduce the strength of the basemat and, therefore, are not included in the design load combinations. This is not acceptable, because the settlement-induced stresses during construction may potentially be additive to the design basis loads at some locations depending on the further construction sequence, the geometry of structures and the sense of the settlement-induced forces and moments. For such cases, these forces and moments should be considered in the design in combination with other design basis loads. In addition, the staff's review of Westinghouse's design calculations shows that a correction factor of 2.9 was used to convert the 2D analysis results to 3D results while computing the construction sequence-related stresses in the basemat segments. The use of such a large correction factor has not been shown to be appropriate to yield conservative design results. Westinghouse should include the loads due to construction sequence in the basemat design.

Status of Open Items in SSAR Sections 3.9.2, 3.9.5, & 3.9.7
Reactor Internals

1. DSER# 3.9.2.3-2 (783) - Flow-induced vibration prediction analysis
   Action W

In SSAR Revision 10, the first paragraph of Subsection 3.9.2.3 indicates that the flow-induced vibration assessment is documented in WCAP-14761, which is also included in the reference list in SSAR Section 3.9.9. This is acceptable. The WCAP-14761 is a replacement of previous report MI01-GER-001, which was submitted by Westinghouse and reviewed by the staff and found acceptable.

However, the reactor internals of the first AP600 plant is designated as the prototype as defined in SRP 3.9.2 and RG 1.20 for vibration assessment of AP600 reactor internals. Information of vibration assessment from reference plants, which include H. B. Robinson, Doel 3 and 4, etc. may only be used in vibration prediction analysis for the prototype and should not be confused with the prototype. The wording in SSAR Sections 3.9.2.3 and 3.9.2.4 should be revised to avoid confusion between the "prototype" and the "reference plants."

2. DSER# 3.9.2.4-1 (785) - Japanese control rod drive mechanism (CRDM) seismic input tests - RAI 210.94
   Resolved

Subsection 3.9.4.3 of SSAR Revision 10 indicates that the functional capability of the CRDM following a seismic event or a pipe break is assured by analysis. The stresses in the CRDM and the rod travel housing are bounded by the ASME Code limits, and their deflections are within the limits specified in the SSAR Section 3.9.7 to ensure that control rods do not bind during insertion. This is acceptable.

3. DSER# 3.9.5-1, RAI 210.226, (OITS 3517) - 20% damping value for fuel assemblies
   Resolved

Information provided in Westinghouse letter NSD-NRC-97-4933, dated 1/8/97, indicates that the damping value is justified by testing and is consistent with evaluations for Westinghouse-designed fuel in operating nuclear power plants. This is acceptable. However, Westinghouse needs to provide a suitable reference in the SSAR.

4. DSER# 3.9.7.3-1 (OITS 3374) - Potential thinning of incore neutron monitoring thimbles
   Resolved

Westinghouse letter NSD-NRC-96-4841 dated 10/14/96 indicates that the AP600 incore thimble is an improved design which uses better wear resistant

material, has a larger diameter, is stiffer, and has a smaller gap between the thimble and the guide tube. All these features results in minimized vibration. In addition, the double-wall design feature will prevent a non-isolable leak of reactor coolant, and preclude the need for inservice inspection. Westinghouse also revised the final paragraph in Subsection 3.9.7.2 of the SSAR Revision 10. The staff found that the letter response and the SSAR revision are acceptable.

5. DSER# 3.9.7-1 (OITS 812) - Deflection limits for integrated head package - RAI 210.97
   Resolved

Westinghouse letter NSD-NRC-96-4841, dated 10/14/96, indicates that the deflection limits for the integrated head package are based on limiting deflections of the CRDM housing to ensure control rod insertion following a seismic event or a pipe break. Westinghouse further indicates that whether 4" or 6" pipe break resulting from on-going staff review in LBB is inconsequential to CRDM design due to the more limiting LOCA loads being postulated. Since Open Item 3.9.2.4-1 is closed, and 3.6.3.4-1 and 3.6.3.6-4 are inconsequential, Open Item 3.9.7-1 is closed.

Status of Open Issues on SSAR Section 3.9.6
Inservice Testing (IST) Issues

Based on the review of AP600 SSAR (Rev. 10) and Westinghouse letter responses to IST questions dated 12/17/96, the staff finds that the following issues are still open. Additionally, a telephone conference was held on January 31, 1997 to discuss the issues described below. To resolve many of these issues, additional SSAR revisions are required. Requests for additional information are listed in Enclosure 1 of this letter.

1. Westinghouse Tracking System (OITS) Item Nos. 798, 800, 810, and 811
   Action W

These issues are related to valve qualification testing. Westinghouse has not provided SSAR revisions to resolve these issues. In its letter dated December 17, 1996, Westinghouse did not address these issues but indicated that it would be addressed in a separate response. To resolve these issues, Westinghouse must revise the SSAR Section 5.4.8.1 to include those provisions of valve design and qualification that are circled and identified in Attachment 3 of telephone conference summary dated October 11, 1996. As of January 31, 1997, Westinghouse is continuing work on its response.

2. OITS Item No. 801
   Action W

SSAR changes are needed in the check valve pre-op testing section on page 5.4-52 to indicate that check valves are tested in both directions. SSAR Subsections 5.4.8.1.1.2, 5.4.8.1.2.2, and 5.4.8.1.3.2 incorrectly identify the ISTP as Table 3.9-17. It should be Table 3.9-16.

Westinghouse had added SSAR Subsection 3.9.6.2.3 to address valve disassembly and inspection. The disassembly and inspection program must also be addressed in Section 3.9.8, as the COL will have to develop this program.

Note that there are two SSAR Subsections 5.4.8.1.1.2, but no Subsection 5.4.8.1.1.1.

Changes to the second paragraph in SSAR Subsection 5.4.8.1.1.2 (Design and Qualification) is necessary, as this section states that design provisions for non-intrusive determination of disk position and potential valve degradation will only be provided for selected valves. Per SECY 94-084, the SSAR must be revised to state that, to the extent practical, each valve's obturator movement should be capable of observation by direct indication or non-intrusive techniques. As of January 31, 1997, Westinghouse is continuing work on its response.

3. OITS Item No. 805
   Action W

Valves RNS-V002A/B are CIVs and are Type C tested per SSAR Table 6.2.3-1. These valves should be leak tested in the ISTP, Table 3.9-16. In the January 31, 1997, telephone conference, Westinghouse will revise SSAR Table 6.2.3-1.

4. OITS Item No. 807
Action W

Per NRC comments on the testing deferral, revise Note 4, Note 9, Note 11, and Note 21 in SSAR Table 3.9-16. In the January 31, 1997, telephone conference, Westinghouse stated they will provide additional justification on the use of solenoid operated valves for the head vent (Note 4); provide additional information on "sufficiently long" cold shutdown times (Note 9); delete RNS-PL-V046 from Note 21 and the table (Note 21); provide additional information on the testing capabilities of VES-PL-V0008 A and B (Note 21). The staff will respond to the Westinghouse December 17, 1996, letter regarding Note 11.

5. OITS Item No. 809
Action W

Delete the first sentence of the second paragraph in SSAR Subsection 3.9.6.2, and move the second sentence to the end of the paragraph. Westinghouse will revise the SSAR.

6. OITS Item No. 1730
Action W

Valve PCS-V014A is a normally closed stop check valve (P&ID Fig. 6.2.2.1 of the SSAR, Rev.6 and Rev.9) with a safety function to open. However, no check exercise is specified and the valve is still identified as a Category B valve in Revision 10. Westinghouse will revise the SSAR.

7. OITS Item No. 1731
Action W

Westinghouse has stated that valves RCS-PL-150VA-D have an active function to move to the open position. However, SSAR Fig. 5.1-5 identifies these valves as failed closed. The IST Table should be revised such that these valves are subject to a fail-safe test, or the P&ID should be revised. Westinghouse will include the testing in the SSAR.

13. RAI Q952-96
Action N

In a letter response dated May 13, 1996, Westinghouse continues to state that the ADS valves will be tested at conditions determined with input from type selection testing. The qualification testing of the prototypical ADS valves should be performed under design basis conditions. From the January 31, 1997, telephone conference, Westinghouse stated the response did not apply to ISTP. The staff will review the issue further for acceptability.

Status of Open Items Related to DSFR Section 3.12
Piping Design

A. Updated status for items which were open during 12/5/96 meeting:
(Up to SSAR Revision 10)

- Modeling uncertainties:

1. DSER 3.12.3-1 (OITS 822)
Action W

Item 2.b -- Westinghouse letter, dated 11/11/96, was discussed in 12/5/96 meeting. The changes in Subsection 3.7.3.17 of SSAR Revision 10 are acceptable. However, as discussed at the 12/5/96 meeting, the mixed use of time history analysis and response spectra analysis for the four soil cases is unacceptable. The SSAR needs to be revised to exclude this option.

- Piping functional capability:

2. DSER 3.12.5.3-1 (OITS 832)
Action W

Item (E) -- Westinghouse response in 10/28/96 letter was discussed in the 12/5/96 meeting.

Table 3.9-11 of SSAR, Revision 10 should be further revised to make Footnotes 3 and 4 also applicable to Class 1 piping. At the 12/5/96 meeting, the staff took the action to internally discuss the use of ASME Level D versus Level C regarding allowable stresses for the evaluation of the functional capability of piping systems. The staff finds that the Westinghouse proposal is inconsistent with NUREG-1367 and therefore, is unacceptable.

3. DSER 3.12.5.12-1 (OITS 838)
Action W

This item is pending resolution of OITS 832.(E) above.

4. DSER 3.12.5.19-7 (OITS 847)
Resolved

The changes in Subsection 5.2.1.1 of SSAR Revision 9 are acceptable. This item is decoupled from OITS 832.(E).

- Thermal stratification:

5. DSER 3.12.5.9-1 (OITS 836)
   Action W

In the 12/5/96 meeting, the application of the EPRI report to the AP600 was discussed, and Westinghouse calculation in GW-PLC-001 was audited. Westinghouse agreed to delete the SSAR reference to the EPRI report. The results of the Computation Fluid Dynamics (CFD) plan for the normal RHR line, PRHR return line, and ADS Stage 4 line, as Westinghouse proposed in its 12/16/96 letter for addressing uncertainty of the temperature profiles, should be submitted.

6. DSER 3.12.5.10-1 (OITS 837)
   Resolved

The changes in Subsection 3.9.3.1.2 of SSAR Revision 9 are acceptable.

- Composite damping:

7. DSER 3.12.5.3-2 (OITS 833)
   Resolved

The changes in SSAR Subsection 3.7.3.15 and Table 3.7.1-1, Revision 10 are acceptable.

8. DSER 3.12.5.16-1 (OITS 839)
   Resolved

The changes in SSAR Subsection 3.7.3.15 and Table 3.7.1-1 of Revision 10 are acceptable.

- Large snubber dynamic testing:

9. DSER 3.9.3.3-1 (OITS 792)

W-Confirm The response in the Westinghouse letter, dated 10/23/96, is acceptable. Westinghouse must revise the SSAR.

10. DSER 3.12.6-1 (OITS 848)
    W-Confirm

Proposed SSAR changes in the Westinghouse letter, dated 10/23/96, are acceptable. Westinghouse needs to revise the SSAR Subsections 1.9 and 3.9.3.4.3 to the incorporate changes.

B. Open Items resolved prior to the 12/5/96 meeting:

11. DSER 3.12.3.5-1 (OITS 823)
The changes in SSAR Subsection 3.9.3.1.5, Revision 4 are acceptable.

12. DSER 3.12.3.7-1 (OITS 824)
The changes in SSAR Subsection 3.7.3.13.4.2, Revision 7 are acceptable.

13. DSER 3.12.4.1-1 (OITS 825)
The differences in the analysis were resolved in 6/25/96 audit.

14. DSER 3.12.4.1-2 (OITS 826)
Westinghouse provided the information requested by Brookhaven National Laboratory.

15. DSER 3.12.4.2-1 (OITS 827)
The changes in SSAR Subsection 3.7.3.8.2.1, Revision 9 are acceptable.

16. DSER 3.12.4.3-1 (OITS 828)
The changes in SSAR Subsection 3.9.1.2, Revision 9 are acceptable.

17. DSER 3.12.4.4-1 (OITS 829)
The changes in SSAR Subsection 3.7.3.8.1, Revision 7 are acceptable.

18. DSER 3.12.4.4-1 (OITS 830)
The changes in SSAR Subsection 3.7.3.8.2.1, Revision 9 are acceptable.

19. DSER 3.12.5.1-1 (OITS 831)
The changes in SSAR Subsection 3.7.3.9, Revision 7 are acceptable.

20. DSER 3.12.5.6-1 (OITS 834)
The changes in SSAR Subsection 3.7.3.7.1, Revision 2 are acceptable.

21. DSER 3.12.5.6-2 (OITS 835)
Independent confirmatory analysis is complete, and comparison of analysis results is acceptable.

22. DSER 3.12.5.17-1 (OITS 840)
The changes in SSAR Subsection 3.9.3.1.5, Revision 4 are acceptable.

23. DSER 3.12.5.19-1 (OITS 841)
Westinghouse will not use alternate piping criteria for safety related piping.

24. DSER 3.12.5.19-2 (OITS 842)
The changes in Table 3.9-11 of SSAR Revision 9 are acceptable to address this issue. However, the table needs to be revised again for OITS 832.(E) issues.

25. DSER 3.12.5.19-3 (OITS 843)
Westinghouse will not use alternate piping criteria.

26. DSER 3.12.5.19-4 (OITS 844)
Westinghouse will not use alternate piping criteria.

27. DSER 3.12.5.19-5 (OITS 845)
The changes in Table 3.9-3 of SSAR Revision 9 are acceptable.

28. DSER 3.12.5.19-6 (OITS 846)
Table 3.9-16 was deleted in SSAR Revision 4, and Westinghouse will not use alternate piping criteria.

29. DSER 3.12.6.1-1 (OITS 849)
The changes in SSAR Subsection 3.9.3.4, Revision 4 are acceptable.

30. DSER 3.12.6.3-1 (OITS 850)
Notes (8) and (9) in Table 3.9-8 of SSAR Revision 9 are acceptable.

31. DSER 3.12.6.5-1 (OITS 851)
The changes in SSAR Subsection 3.7.3.8.4, Revision 7 are acceptable.

32. DSER 3.12.6.7-1 (OITS 852)
The changes in Subsection 3.9.3.4 of SSAR Revision 4 and Table 3.9-8 of SSAR Revision 10 are acceptable.

33. DSER 3.12.6.11-1 (OITS 853)
The changes in Subsection 3.9.3.4 of SSAR Revision 4 are acceptable.

34. DSER CN 3.12.3.6-1 (OITS 1812)
The changes in Subsection 3.7.3.5.1 of SSAR Revision 9 are acceptable.

35. DSER CN 3.12.3.6-2 (OITS 1813)
The changes in Subsection 3.7.3.5.1 of SSAR Revision 9 are acceptable.

36. DSER CN 3.12.5.5-1 (OITS 1814)
The changes in Subsection 3.7.3.7.2 of SSAR Revision 9 are acceptable.

Status of Certain Open Items in Probabilistic Risk Assessment Chapter 42
Containment Failure Probability

1. RAI OI (OITS 2703)
   Action N

The staff is reviewing the response.

2. RAI OI (OITS 2704)
   Action N

The staff is reviewing the response.

3. RAI OI (OITS 2705)
   Closed

The Westinghouse response is acceptable.

4. RAI OI (OITS 2706)
   Action N

The staff is reviewing the response.

5. RAI OI (OITS 2707 through 2716)
   Closed

The Westinghouse responses are acceptable.

Enclosure 8