# COVER SHEET

# FAX

RECEIVED
FEB 1 8 1997
Brian A. Mc Intyre

**To:** Bill Huffman/L. Lois(NRC), Cliff Fineman(INEL), L. Hochreiter(PSU)
**Subject:** Text to close some WCOBRA/TRAC CAD Discussion Items
**Date:** February 14, 1997
**Pages:** 10, including this cover sheet.

COMMENTS:

Attached are responses which I believe will resolve many of the WC/T discussion items issued regarding WCAP-14171, Revision 1. The items which are closed by the attached, in accordance with our past telecons, are: 1a,1b,1f,1g,1i,2a,2b,2c,2d,2e,2g,4,5,6,7a,7b,7c,7d, 8c,8d,8e,9b,9d,10e,12a,12b,12f. Please direct any comments about the attachment to the undersigned.

cc: B. Rarig, B. McIntyre (for informal NRC correspondence file), E. Novendstern

EC-E
309

Bob

From the desk of...
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# COMMENTS ON WESTINGHOUSE'S REPORT
# WCAP-14171, REV. 1
# WCOBRA/TRAC APPLICABILITY TO AP600 LBLOCA

NOTE: The questions are based on the review of information Westinghouse submitted in Reference 1.

1. The following questions relate to the AP600 Phenomena Identification and Ranking Table (PIRT) presented by Westinghouse in Section 2.1 of Reference 1. They also represent followup questions to Item 8e in the May 17, 1996, NRC letter.

   a. In several cases, Westinghouse stated that a lower ranking was given to a certain phenomenon in the AP600 because of the low peak cladding temperatures (PCTs) calculated for the plant. Examples include reflood heat transfer, entrainment/deentrainment in the core, and containment pressure. For these phenomena, and for others if Westinghouse makes similar arguments for them, clarify if (a) calculating these phenomena are important even if PCTs are low or (b) they are important because they contribute to the calculation of the lower PCTs. If Westinghouse answers yes to either a or b above, provide additional information to justify the lower AP600 ranking.

      ***The calculation of these parameters is important to the calculation of the PCT. However, because of the lower kw/ft rating of the AP600, better blowdown cooling, etc., one can have a larger allowable uncertainty in the calculation of these phenomena. Therefore, they are ranked lower than for a 3/4 loop plant in which there is less margin available and for which one can not tolerate a large uncertainty.***

   b. For containment pressure, reflood heat transfer, and core entrainment/deentrainment, and for other phenomena if Westinghouse makes similar arguments about the lower AP600 PCTs for them, clarify if the INEL understanding is correct regarding the conservatism of the calculations or how the uncertainty is accounted for in the Westinghouse methodology:

      (1) containment pressure: Westinghouse uses a lower bound containment pressure consistent with current conservative (Appendix K) analyses.

      ***See Table 4.4-1, a bounded value is used similar to Appendix K.***

      (2) reflood heat transfer: Uncertainties in this area are included in the uncertainty methodology.

      ***Correct, uncertainties are included in the uncertainty methodology same as 3/4 plants.***

(3) core entrainment/deentrainment: WCOBRA/TRAC analyses are conservative in this area as discussed in Section 3.1.6 of the Revised Methodology Report (RMR).[2] In addition, the uncertainty in core entrainment/deentrainment is covered in Westinghouse's overall heat transfer coefficient (HTC) multiplier methodology, which captures differences in local fluid conditions.

***Correct, uncertainties are treated in the same fashion as 3/4 loop plants.***

f. On page 2-2, Westinghouse stated that core top down flow/CCF limit is addressed under the PIRT upper plenum component discussion. However, the PIRT does not rank upper plenum CCF drain/fallback while the upper head blowdown flow is ranked. Clarify if the upper head ranking is what Westinghouse was referring to on page 2-2, or if Westinghouse was referring to the information on page 2-8 discussed in part d.

***The discussion of the CCFL is on page 2-8, 4th paragraph. The phenomena is not ranked since its effects only occur momentarily at the end of blowdown as the flow transitions from co-current downflow to co-current upflow during the reflood phase.***

g. Given the AP600 results in Section 2.2.3, clarify if the INEL is correct in interpreting that accumulator nitrogen discharge is not an large break loss-of-coolant accident (LBLOCA) issue with AP600 because the core quenches before the accumulators empty. Clarify how much liquid is left in the AP600 accumulators at the end of the analysis discussed in Section 2.2.3 and how long it would take for the accumulators to empty. If there is less than 20% of the accumulator liquid left at the end of the analysis (so that a change in plant design or the analysis could result in the accumulators emptying) or Westinghouse concludes accumulator nitrogen discharge is a LBLOCA issue for AP600, then provide the following information. On page 2-10, Westinghouse stated that the affects of nitrogen discharge after the accumulators empty were addressed in the Code Scaling, Applicability, and Uncertainty (CSAU) report.[3] However, in the CSAU report, only the affects of dissolved non-condensibles were studied, not the large amounts of nitrogen discharged after the accumulators empty. Therefore, clarify this reference to the CSAU report or provide the correct reference. Also, is accumulator nitrogen discharge addressed for AP600 in the same manner as for 3-/4-loop plants?

***The PCT occurs before the accumulator is empty. In the SSAR DECLG break analysis, the remaining accumulator inventory when the reflood PCT is reached, is about 60% of the initial. The accumulators empty at 300 seconds which is over 200 seconds after the PCT. Addressing the uncertainty in the accumulator nitrogen discharge is not needed since the accumulators are still injecting well after the PCT and inclusion of the uncertainty would not effect the calculated PCT.***

h. In the call on November 25, 1996, Westinghouse stated Discussion Item 8b from the May 17, 1996, letter was discussed in the 4th paragraph of Section 2.1. This paragraph, however, addresses downcomer behavior not upper plenum CCF/fall back. Should Westinghouse have referred INEL to page 2-8, 4th paragraph?

***Yes.***

i. As a followup to Discussion Item 8d, May 17, 1996, letter.

(2) For core entrainment/deentrainment and reflood interfacial heat and mass transfer (as part of reflood heat transfer) see parts a and b above. For core top down flow/CCF, upper plenum multidimensional flow/flow distribution (hot legs/core), and upper plenum CCF/fall back see parts d and e above.

***See responses to parts a and b provided herein and to parts d and e when provided.***

(3) For core multidimensional flow in reflood, clarify the low Westinghouse ranking relative to the CSAU study and the LANL PIRT (see page 64 of the LANL report).[4]

***This phenomenon is ranked lower than in the LANL PIRT. The LANL words on Page 64 are correct, however, we have a different interpretation of the phenomena. The quench front is uniform, not 3D, across the different powered bundles such that there can be flow crossflow into the hot assembly from the adjacent assemblies below the quench front as the water level moves up the core uniformly. This does not mean that there would be additional entrainment as indicated by LANL into the hot assembly. The presence of lower power assemblies tends to reduce the total amount of entrainment and, therefore, that increases the inlet flooding rate for a gravity reflood situation. This does not mean that there are strong 3D effects. WCOBRA/TRAC captures the significant 3D effects.***

2. These items relate to Table 2.1-2 and followup Item 8f (5/17/96 letter).

a. Because of low PCTs, Westinghouse has a low ranking for cladding oxidation in its PIRT and did not discuss cladding oxidation in Table 2.1-2. The INEL agrees that the low cladding temperatures currently calculated by Westinghouse for the AP600 indicate this is not an important phenomenon for the AP600. For 3-/4-loop plants, however, the uncertainty evaluation included the cladding oxidation uncertainty. Clarify if Westinghouse has removed cladding oxidation uncertainty from the AP600 uncertainty evaluation. If yes, will Westinghouse commit to including cladding oxidation uncertainty if plant design or analysis changes result in calculated cladding temperatures that cause oxidation to be important?

***The calculated PCTs are significantly below the threshold for significant zirc/water reaction which can influence the PCT. If the calculated PCT increases to where it can contribute to the overall PCT calculation the uncertainty in the oxidation calculation would have to be considered in the same fashion as the 3/4 loop plants. However, this is not anticipated to occur.***

b. Gap conductance was not listed in Table 2.1-2. Based on the discussion on page 2-4, is the INEL correct in interpreting that this highly ranked phenomenon is covered under stored energy?

***Yes***

c. Westinghouse stated decay heat uncertainty is addressed in the same manner as 3-/4-loop plants. However, the portion of the 3-/4-loop plant methodology that addressed decay heat was changed for application to AP600. Therefore, provide additional information to justify how the decay heat uncertainty is addressed for the AP600 plant.

***Table 2.1-2 is incorrect. As described in Section 4.4, the use of tech spec/COLR peaking factors and 102% core power results in equivalent or higher linear heat rates than if the full best-estimate methodology were used. The questions 12c response will give further information.***

d. For rewet, Westinghouse stated the same approach for 3-/4-loop plants would be used to address the uncertainty. Clarify if Table 2.1-2 should also state that this approach is supplemented by the information in Section 4.1

***Yes, reviewer is correct. A more conservative approach will be used for the AP600, as discussed in Section 4.1.***

e. Westinghouse did not discuss the following highly ranked PIRT items in Table 2.1-2: core 3D flow and void generation/distribution, core flow reversal/stagnation, upper head blowdown flow and flow area, downcomer condensation, and direct vessel injection (DVI).

***Only the 8s and 9s are regarded as high. The table will be changed to reflect this.***

g. For hot wall effects in the downcomer and lower plenum, Westinghouse provided information different from that supplied for 3-/4-loop plants in Reference 5. Clarify the reasons for the differences.

***Hot wall effects are ranked the same for 3/4 loop plants and AP600.***

4. Westinghouse discussed pressurizer location in AP600 LBLOCA analyses on page 2-32. The reference given to support the chosen location does not seem correct; therefore, provide the correct reference. Also, have any AP600 specific studies been performed to support the pressurizer location relative to the break? If yes, provide them for review. If not, justify why they are not needed.

***The impact of pressurizer location relative to the break has been investigated in a sensitivity case. The location that is indicated in WCAP-14171, Revision 1 has been shown limiting. The reference provided is incorrect; it should be Reference 5.***

5. On page 2-33, Westinghouse stated that after 10 s vapor flows out of the core in the guide tube locations. Clarify this statement because Figure 2.2-34 shows vapor downflow after 10 s.

***The last sentence on page 2-33 should read "During this time interval, vapor flows down into the core at the guide tube locations" rather than "up out of the core."***

6. Westinghouse's discussion on the response of the low power rod in Figures 2.2-31 to 2.2-33 on page 2-34 is confusing. First, Westinghouse indicates that the low power rod undergoes a small temperature excursion but later states that no initial temperature excursion in blowdown. Based on Figures 2.2-31 to 2.2-33, the later statement appears to be correct. Therefore, clarify the apparent inconsistency or correct the report.

***The text should read that the peripheral rod exhibits "no significant initial temperature excursion" during blowdown. Review of Figures 2.2-31 and 32 indicates that at the 6.0 and 8.5 foot elevations a small temperature increase, on the order of 10 degrees F, is predicted at the inception of blowdown.***

7. The following questions relate to the CCTF analysis in Section 3.1.

   a. Clarify the statement on page 3-8 that in the calculation the low power rods quench early at the lower elevations. Figures 3.1-16 to 20 show an early quench calculated at all elevations.

      ***Figures 3.1-16 through 3.1-30 indicate that WCOBRA/TRAC predicts an early quench of all fuel rods modeled in the simulation of CCTF Test 58 at all elevations. The lower elevations are emphasized because the exceedingly delayed quenching of the upper elevations in this CCTF test is not important relative to the AP600 large break LOCA event, in which the quenching of all rods occurs within 100 seconds.***

b. Clarify the statement on page 3-9 that Figures 3.1-31 to 33 show the calculated quench front is 80 s too early. This is true for the high power rods, but the quench fronts on the medium and low power rods are early by approximately 120 s.

***The fact that WCOBRA/TRAC predicts early quenching of the uppermost elevations of the medium and low power rods in CCTF Test 58 is unimportant. As shown in Figure 2.2-26 of the report, all fuel in the AP600 core quenches during the first 100 seconds of the large break LOCA transient. Therefore, the most significant comparison of quenching is for elevations between the bottom core elevation and the elevation for which WCOBRA/TRAC predicts the maximum quench time. Within this elevation envelope, the code-predicted quenching occurs within 80 seconds of the times observed in the CCTF Test 58 for rods at each power level.***

c. Clarify if the first paragraph on page 3-10 should be deleted because it refers to the WCOBRA/TRAC analysis in Rev. 0 of Reference 1.

***The first two sentences of the first paragraph on page 3-10 are artifacts of WCAP-14171, Revision 0 and should be deleted.***

d. Clarify if the references to Figures 3.1-41 and 3.1-41A, Rev. 0 and Rev. 1, respectively, in the fourth paragraph on page 3-10 should have been to Figures 3.1-45 and 3.1-45A.

***The fourth paragraph on page 3-10 contains a typographical error; references made to Figures 3.1-41 and 3.1-41A should instead refer to Figures 3.1-45 and 3.1-45A, respectively.***

8. The following questions relate to the UPTF analysis in Section 3.2.

c. In the discussion on page 3-81 on the LOFT lower plenum refill, provide comparisons between the Westinghouse WCOBRA/TRAC results for LOFT Tests L2-2/2-3 and the test data for L2-2/2-3 already provided in Reference 1. This is a followup to Item 7, May 17, 1996, letter.

***The LOFT L2-5 comparison shows that the lower plenum and core refill predicted by WCOBRA/TRAC is conservative (page 3-81). Further documentation of this may be found in the WCOBRA/TRAC "Compensating Errors" Report, NTD-NRC-95-4586, for LOFT Test L2-3 (See Figure a10). Taken together, the L2-3 and L2-5 comparisons are adequate to resolve that the code capably and conservatively predicts AP600 lower plenum filling.***

d. In response to RAI 440.348, Westinghouse provided a table comparing UPTF Test 21 test conditions to AP600 conditions. For the comparison in Reference 1, the AP600 table was different from that provided in the RAI response. Clarify the reasons for the differences.

***The AP600 conditions in the WCAP-14171 Rev. 1 Table are taken from the WCOBRA/TRAC analysis presented in Chapter 2, which had not been performed at the time of the RAI440.348 response. The condition differences are not great and are a result of modeling more restrictive accumulator conditions, specifically a higher water temperature and a lower injection flow (Refer to Table 2.2-2) which causes the "Total ECC Injection to Downcomer" and the maximum ECC water subcooling value to be somewhat reduced. The steam flowrate from the core into the downcomer has a lower value because end-of-bypass is delayed with these accumulator conditions.***

e. Based on the information in Section 3.2.8, is the INEL correct in assuming that there is not sufficient data to develop a flooding curve for the CCTF and UPTF DVI tests directly from the test data and that other flooding correlations are not applicable for the reasons discussed in that section? This is a followup question to Discussion Item 6a, May 17, 1996, letter.

***Yes, the INEL interpretation is correct.***

9. The following questions relate to Section 4.1.

b. Is the $T_{MIN}$ identified in Section 4.1 used in blowdown only or both blowdown and reflood?

***The Tmin value identified in Section 4.1 is used during blowdown only.***

d. On page 4-4, Westinghouse discussed the temperature criterion used to screen the initial temperatures of the thermocouples used in the $T_{MIN}$ evaluation. The temperature given was an average $T_{MIN}$ based on bundle average data from the RMR analysis. Justify whether it is appropriate to use this bundle average temperature $T_{MIN}$ to screen individual thermocouples as done in Section 4.1.

***This approach is designed to be conservative since the only T/Cs that will be considered are those which are initially GREATER than the average.***

10. The following questions relate to Section 4.2.

e. Clarify the meaning of the word saturated in Table 4.2-1 regarding inlet water temperatures for AP600. Is Westinghouse implying that AP600 sees only saturated water inlet conditions during blowdown? If yes, clarify the temperature range relative to the pressure range which indicates some subcooling for the temperatures given.

***The word "saturated" indicates that AP600 liquid conditions for blowdown cooling are saturated or are very nearly so. The pressure range shown in Table 4.2-1 should read "approximately 250-1500 psia".***

12. The following questions relate to Section 4.4.

a. Table 4.4-1: Has the Westinghouse grid deformation analysis been approved by the NRC? If not, will Westinghouse commit to addressing grid deformation if the NRC review results in this becoming a concern for the AP600? For mixed cores, how will Westinghouse address mixed cores if they are used in AP600 in the future?

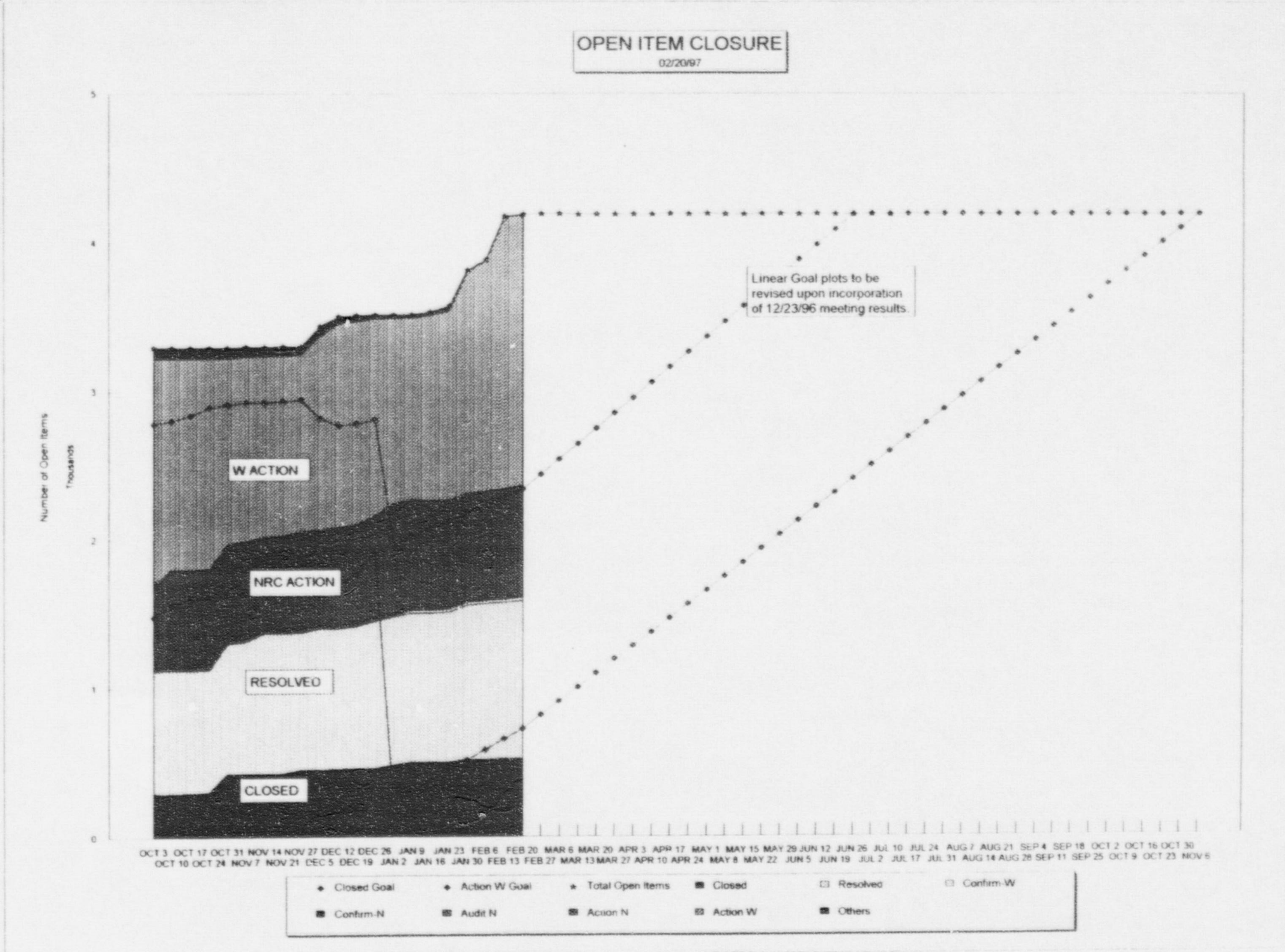
***Since seismic loads are a site-specific parameter, it is difficult to assess their impact at this time. In the event fuel grid deformation becomes a concern for a proposed AP600 site, Westinghouse will address its impact on the large break LOCA analysis. If Westinghouse fuel of a different design or another vendor's fuel is placed into AP600 in the future, an evaluation will be performed of the mixed core; the evaluation will consider any differences in the dimensions, hydraulic resistances and burnup effects between the fuel types to be loaded.***

b. Westinghouse identified power shapes (PSs) 2, 3, 4 and 11 as the PSs it would evaluate from the RMR to determine the limiting PS for AP600. Justify the basis for selecting these PSs as the ones to study the AP600. Could the excellent blowdown cooling for the AP600 cause the limiting axial power shape(s) to change for AP600 relative to the 3-/4-loop plants? Also, Westinghouse has an approach to identify limiting axial power shapes to meet Appendix K, Item I.A. Does this approach have any applicability for AP600? Justify your answer.

***The 3/4 loop power shapes were established to be bounding for all Westinghouse core designs, and they are bounding for AP600 as well. To further demonstrate the limiting nature of power shapes 2, 3, 4 and 11 for AP600, a bottom-skewed power shape case was also executed and shown to be non-limiting. Power shape 3 is the bounding shape and is applied in all AP600 matrix sensitivity cases. The power shape results will be reported in the SSAR large break LOCA section.***

f. Justify the basis for the choice of bounding accumulator conditions on page 4-14. Based on the CQD studies in Section 22, sometimes the limiting PCT was calculated when an accumulator condition other than those proposed for AP600 by Westinghouse was used. Are sensitivity studies needed? Justify your answer.

***The AP600 is equipped with two large accumulators for large break LOCA mitigation. Because of the limited accumulator capacity which 3/4 loop plants possess, downcomer underfill and downcomer boiling during core reflood associated with a minimum initial accumulator water volume can sometimes result in a more limiting PCT, These phenomena are unimportant for AP600; the significant phenomenon for AP600 reflood PCT is the time required to refill the downcomer. A sensitivity case executed assuming the Technical Specification maximum gas pressure in the accumulator has verified that bounding the accumulator injection rate on the low end is indeed the conservative approach.***



OPEN ITEM CLOSURE
02/20/97
Number of Open Items
Thousands
0
1
2
3
4
5
W ACTION
NRC ACTION
RESOLVED
CLOSED
Linear Goal plots to be revised upon incorporation of 12/23/96 meeting results.
OCT 3 OCT 17 OCT 31 NOV 14 NOV 27 DEC 12 DEC 26 JAN 9 JAN 23 FEB 6 FEB 20 MAR 6 MAR 20 APR 3 APR 17 MAY 1 MAY 15 MAY 29 JUN 12 JUN 26 JUL 10 JUL 24 AUG 7 AUG 21 SEP 4 SEP 18 OCT 2 OCT 16 OCT 30
OCT 10 OCT 24 NOV 7 NOV 21 DEC 5 DEC 19 JAN 2 JAN 16 JAN 30 FEB 13 FEB 27 MAR 13 MAR 27 APR 10 APR 24 MAY 8 MAY 22 JUN 5 JUN 19 JUL 2 JUL 17 JUL 31 AUG 14 AUG 28 SEP 11 SEP 25 OCT 9 OCT 23 NOV 6
Closed Goal
Action W Goal
Total Open Items
Closed
Resolved
Confirm-W
Confirm-N
Audit N
Action N
Action W
Others

Westinghouse

# FAX COVER SHEET

| RECIPIENT INFORMATION | | SENDER INFORMATION | |
|---|---|---|---|
| DATE: | February 21, 1997 | NAME: | Jim Winters |
| TO: | Diane Jackson | LOCATION: | ENERGY CENTER - EAST |
| PHONE: | FACSIMILE: | PHONE: | Office: 412-374-5290 |
| COMPANY: | US NRC | Facsimile: | win: 284-4887<br>outside: (412)374-4887 |
| LOCATION: | | | |

Cover + Pages 1 + 1

**The following pages are being sent from the Westinghouse Energy Center, East Tower, Monroeville, PA. If any problems occur during this transmission, please call:**

**WIN: 284-5125 (Janice) or Outside: (412)374-5125.**

COMMENTS:

Diane

This markup should resolve item 7.6(5) of your 10/17/96 letter (OITS item 266). Unlike other HVAC subsystems no sketch is required since the subsystem is simply four supply air handling units. Further definition of the supply air handling unit's components is found in subsection 9.4.2.2.2. This will go into SSAR Revision 12 unless we hear from you.

Jim

cc: Lindgren
McIntyre
Kunvijuk
Cummins
Winters
Hutchings
Jeanne Evans.

requiring close temperature control such as the security area offices and the central alarm station. Hot water unit heaters are provided in the north air handling equipment room to maintain the area above 50°F.

A humidifier is provided in the branch duct to the security areas to provide a minimum space relative humidity of 35 percent.

Each non-Class 1E battery room is provided with an individual exhaust system to prevent the buildup of hydrogen gas in the room. Each exhaust system consists of an exhaust fan, an exhaust air duct and gravity back draft damper located in the fan discharge. Air supplied to the battery rooms by the air handling units is exhausted to atmosphere. Air from the rest rooms is exhausted to atmosphere by a separate exhaust fan.

### 9.4.2.2.1.4 MSIV Compartment HVAC Subsystem

The main steam isolation valve compartment HVAC subsystem serves the two main steam isolation valve compartments in the auxiliary building that contain the main steam and feedwater lines routed between the containment and the turbine building. Each compartment is provided with separate heating and cooling equipment.

per compartment

The main steam isolation valve compartment HVAC subsystem consists of two 100 percent capacity supply air handling units with ~~only low efficiency filters,~~ ducted supply air distribution, automatic controls, and accessories for each main steam isolation valve compartment. directly to the space served,

The supply air handling units are located directly within the space served. One unit in each compartment normally operates to maintain the temperature of the compartment. The air handling units can be connected to the standby power system, for investment protection, in the event of loss of the plant ac electrical system.

### 9.4.2.2.1.5 Mechanical Equipment Areas HVAC Subsystem

The mechanical equipment areas HVAC subsystem serves the demineralized water deoxygenating room, boric acid batching/transfer rooms, and air handling equipment rooms in the south end of the annex building.

The mechanical equipment areas HVAC subsystem consists of two 50 percent capacity air handling units, a ducted supply and return air system, automatic controls, and accessories.

The air handling units are located in the lower south air handling unit equipment room on elevation 135'-3" of the annex building.

### 9.4.2.2.1.6 Valve/Piping Penetration Room HVAC System

The valve/piping penetration room HVAC subsystem serves the valve/piping penetration room on elevation 100'-0" of the auxiliary building. The valve/piping penetration room HVAC

# FAX to DINO SCALETTI

February 21, 1997

CC: Sharon or Dino, please make copies for: Diane Jackson
Ted Quay

Don Lindgren
Robin Nydes
Bob Tupper
Ed Cummins
Bob Vijuk
Brian McIntyre

**OPEN ITEMS FOR SSAR SECTION 3.2**

This is a background package for the remaining open items for SSAR section 3.2 for your information. SSAR section 3.2 is of interest because by our joint NRC/W schedule, the FSER for this section should be turned into Projects by the end of March. There are 11 Open Items with NRC Status of Action W. All 11 of these items still require some Westinghouse action. Thank you.

Jim

Jim Winters
412-374-5290

# AP600 Open Item Tracking System Database: Executive Summary

**Date: 2/21/97**

**Selection:** [nrc st code]='Action W' And [DSER Section] like '3.2*' Sorted by Item #

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 562 | NRR/EMEB | 3.2.1-1 | DSER-OI | | Lindgren | Action W | Action W | NSD-NRC-96-4841 | |
| | | | | Westinghouse should apply the pertinent quality assurance requiremen Appendix B to 10 CFR 50 to all Seismic Category II SSCs. A commitment to this effect should be added to Section 3.2.1.1.2 and Table 3.2-1 of the SSAR.<br><br>Closed - Statement added to seismic Category II requirements for QA<br>Action W - The staff does not agree. The pertinent QA requirements of Appendix B should be applied to all Seismic Category II structures, systems, and components. This commitment should be added to SSAR Section 3.2.1.1.2 and Table 3.2-1.<br>Resolved - See response in Letter NSD-NRC-96-4841, dated October 14, 1996. Seismic Category II QA will be the same as the QA for RTNSS.<br>Action W - The resolution of this issue is pending the staff's evaluation of responses to RAIs 260.83 and 260.87. | | | | | |
| 563 | NRR/EMEB | 3.2.1-2 | DSER-OI | | Lindgren | Confrm-N | Action W | NSD-NRC-96-4841 | |
| | | | | At a minimum, the new and spent fuel storage racks should meet the applicable quality assurance requirements of Appendix B to 10 CFR Part 50, in addition to being classified as Seismic Category I. Westinghouse should add a note to Sheet 19 of Table 3.2-3 of the SSAR to reflect this position.<br><br>Closed -The fuel rack classification in Table 3.2-3 indicates that they are Seismic Category I. Seismic Category I is required to have Appendix B QA program. A separate note is not required.<br>Action W - Since the new and spent fuel storage racks are classified as AP600 Class D, it is possible that this commitment might be misinterpreted when one consults SSAR Table 3.2-1. According to this table, AP600 Class D components do not have to meet either RG 1.29 seismic design requirements or Appendix B. Table 3.2-1 should be clarified by adding a note to state that although the new and spent fuel storage racks are Class D, they are designed as Seismic Category I, and meet the applicable QA requirements of Appendix B.<br>Resolveded - See response in Letter NSD-NRC-96-4841, dated October 14, 1996. Add requirement for Appendix B for seismic Category I Class D items<br>Confrm-N - Subsection 3.2.2.6 was revised in Revision 10 to specifically state that Appendix B applies to Class D seismic Category I<br>Action W - The resolution of this issue is pending the staff's evaluation of responses to RAIs 260.88 and 260.89 | | | | | |

2 of 6

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 564 | NRR/EMEB | 3.2.2-1 | DSER-OI | | Lindgren | Closed | Action W | | |

Westinghouse should revise Table 3.2-3 and other applicable sections and P&IDs of the SSAR to reflect the staff's position on ECCS classification.

Closed - AP600 Class C lines that provide an ECCS function will require spot radiograph of the welds. This requirement added to 3.2.2.5 in SSAR revision 7.

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 from Westinghouse:

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 IRWST injection check valve V-122 (SSAR Fig. 6.3-1)

Piping from 1st, 2nd & 3rd stage ADVs to 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?

3 of 6

This issue will be discussed during the December 5 & 6, 1996 meeting.

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?

# AP600 Open Item Tracking System Database: Executive Summary

**Date: 2/21/97**

**Selection:** [nrc st code]='Action W' And [DSER Section] like '3.2*' Sorted by item #

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 3481 | NRR/SPLB | 3.2 | RAI-OI | | Lindgren | Action W | Action W | | |

RAI# 410.295 - NRC Letter 8/15/1996, SSAR Table 3.2-3, AP600 Classification of Mechanical and Fluid Systems, Components, and Equipment:
a. Westinghouse needs to revise Table 3.2-3 to provide the classification of the following fluid systems and their associated generalized equipment:

1. Radiologically Controlled Area Ventilation System (VAS)
2. Containment Recirculation Cooling System (VCS)
3. Health Physics and Hot Machine Shop HVAC system (VHS)
4. Radioactive Waste Building HVAC System (VRS)
5. Turbine Building Ventilation System (VTS)
6. Annex/Auxiliary Nonradioactive Ventilation System (VXS)
7. Liquid Waste Management System
8. Gaseous Waste Management System
9. Radiation Monitoring System
10. Main Steam System
11. Condensate Storage System
12. Reactor Coolant Pressure Boundary (RPCB) Leakage Detection and Monitoring System

b. In the previous version, there was a "Location" column in the table, which is useful to the reviewer. It was removed from the table in Revision 8. Bring the location information back to the table.

4 of 6

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 3512 | NRR/EMEB | 3.2 | RAI-OI | | Lindgren | Confrm-N | Action W | NSD-NRC-96-4888 | |

RAI 210.221 - SSAR Table 3.2-3, Sheet 28, Reactor System
The information relative to this system was revised extensively by Revision 8. The following requests for additional information apply to these changes:
a. According to SSAR, Section 3.9.4.2.2, the control rod drive mechanism (CRDM) latch housing and rod travel housing are part of the reactor coolant system (RCS) pressure boundary and are designed to ASME Class 1. Revision 0 of this table in the SSAR contained a commitment to this criteria for these components. However, in Revision 8, these components were deleted. They should be added to this section of the table unless they appear in some other section.
b. The response to Q210.72 agreed to change the classification from Class D to Class C, and the principal construction code for the CRDM Cooling Shroud and the CRDM Seismic Support Plate from AISC 690 to ASME, Section NF. In Revision 8, these two components were deleted from this table and apparently replaced by RXS-MV-10, "Reactor Integrated Head Package," which has AISC-690 as the principal construction code. Table 3.2-3 should be revised by committing to the response to Q210.72.
c. Tag Number Items MI-21, 22, 23, 26, 27, 53, 56, 57, are all classified as non-seismic. These reactor internal items should all be Seismic Category II, or a note should be added for each item to state that the failure of these items will not degrade the functioning of safety-related systems or components to an unacceptable level.
d. In Revision 8, the Incore Instrument Conduit was removed from this table. It should be either replaced, or the basis for its removal should be provided. It was classified as ASME Class 1 in Revision 1 of this table.
e. Provide 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.

5/6

Resolved -
a. The pressure boundary parts of the CRDM will be added to the reactor system in Table 3.2- 3 as Class A items.
b. The CRDM cooling shroud and the CRDM seismic support plate will be added to the reactor system in Table 3.2-3 as Class C items with ASME, Subsection NF as the principle construction code.
c. The non-core support items in the reactor internal will be changed to Seismic Category II in Table 3.2-3.
d. The incore instrument conduit will be added to Table 3.2-3 as incore guide tubes in the incore instrumentation system. The classification is Class A.
e. The core barrel nozzle is seismic Category II. The function of the nozzle is to direct flow. It does not provide core support and does not have to be safety related. The Table 3.2-2 will be revised to include the seismic Category II classification.
Confirm-N - Table 3.2-3 was revised in SSAR Revision 10 to address these issues.

Action W - Revision 10 to the SSAR, Table 3.2-3 provides acceptable responses to RAI 210.221a through d. However, the response to 210.221e 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.

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 4116 | NRR/HQMB | 3.2.1 | RAI-OI | | RTNSS/Kloes | Action W | Action W | | |

RAI# 260.83 Is it Westinghouse's position that RP C.4 of Regulatory Guide (RG) 1.29 is incongruous with the "concept of graded QA"? Also, please explain what Westinghouse's "concept of Graded QA" is and where that concept is defined in the standard safety analysis report (SSAR).

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 4117 | NRR/HQMB | 3.2.1 | RAI-OI | | RTNSS/Kloes | Action W | Action W | | |

RAI# 260.84 Explain how quality assurance requirements for the regulatory treatment of nonsafety systems, systems, and components (RTNSS) which, Westinghouse has defined in Letter NSD-NRC-96-4670, dated March 26, 1996, are also sufficient to satisfy the regulatory requirements for seismic Category II, as described in RG 1.29, i.e., "all activities affecting the safety-related functions of those portions of structures, systems, and components covered under Regulatory Positions 2 and 3" of the RG?

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No. / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 4118 | NRR/HQMB | 3.2.1 | RAI-OI | | RTNSS/Nydes | Action W | Action W | | |

RAI# 260.85 Please identify all RTNSS SSCs that would also satisfy the functional and design criteria of those portions of structures, systems, and components covered under Regulatory Positions 2 and 3 of RG 1.29.

# AP600 Open Item Tracking System Database: Executive Summary

**Date: 2/21/97**

**Selection:** [nrc st code]='Action W' And [DSER Section] like '3.2*' Sorted by Item #

| Item No | Branch | DSER Section/ Question | Type | Title/Description Detail Status | Resp Engineer | (W) Status | NRC Status | Letter No / | Date |
|---|---|---|---|---|---|---|---|---|---|
| 4119 | NRR/HQMB | 3.2.1 | RAI-OI | RAI# 260.86 How would RTNSS QA requirements as defined in NSD-NRC-96-4670 address interface design requirements identified in RP C.3.? | RTNSS/Nydes | Action W | Action W | | |
| 4121 | NRR/HQMB | 3.2.1 | RAI-OI | RAI# 260.88 While the staff may agree that "industrial quality assurance standards are consistent with the guidelines for NRC Quality Group D", it is not clear how you concluded that such standards, without NRC endorsement, satisfy the provisions of Appendix B to 10 CFR 50. Please clarify. | Kloes/Lindgren | Action W | Action W | | |
| 4122 | NRR/HQMB | 3.2.1 | RAI-OI | RAI# 260.89 SSAR Section 3.2.2.2, "Application of Classification," Page 3.2-5, states, in part, "Structures, systems, and components classified equipment class A, B, or C or seismic Category I are basic components as defined in 10 CFR 21." Please clarify how a "Basic Component" as defined in 10 CFR Part 21 can also be classified as Equipment Class D, as defined in SSAR Section 3.2.2.6. | Lindgren | Action W | Action W | | |

6/9/6

Westinghouse FAX COVER SHEET

| RECIPIENT INFORMATION | | SENDER INFORMATION | |
|---|---|---|---|
| DATE: | February 21, 1997 | NAME: | Jim Winters |
| TO: | Bill Huffman | LOCATION: | ENERGY CENTER - EAST |
| PHONE: | FACSIMILE: | PHONE: | Office: 412-374-5290 |
| COMPANY: | USNRC | Facsimile: | win: 284-4887<br>outside: (412)374-4887 |
| LOCATION: | | | |

Cover + Pages 1 + 1

**The following pages are being sent from the Westinghouse Energy Center, East Tower, Monroeville, PA. If any problems occur during this transmission, please call:**

**WIN: 284-5125 (Janice) or Outside: (412)374-5125.**

**COMMENTS:**

Attached is our next try at cable mixing. Changes from the last one we sent you are in redline/strikeout. It is similar, but not exactly, to the one you sent us. If this doesn't take, it's probably time for a phone call.

Jim

cc: Winters
Hayes
Cummins

## INSERT 8.3-Y

A tray designed for a single class of cables shall contain only cables of the same class except that low voltage power cables may be ~~mixed~~routed in raceways with high level signal and control cables if their respective sizes do not differ greatly and if they have compatible operating temperatures. When this is done in trays, the power cable ampacity ~~should be~~is calculated as if all cables in the tray ~~were~~are power cable~~, unless position and grouping are controlled~~. Low voltage power cable and high level signal and control cable will not be routed in common raceways if the fault current, within the breaker or fuse clearing time, is sufficient to heat the insulation to the ignition point.

Westinghouse

# FAX COVER SHEET

| RECIPIENT INFORMATION | | SENDER INFORMATION | |
|---|---|---|---|
| DATE: | FEBRUARY 21, 1997 | NAME: | JIM WINTERS |
| TO: | DIANE JACKSON | LOCATION: | ENERGY CENTER - EAST |
| PHONE: | FACSIMILE: | PHONE: | Office: 412-374-5290 |
| COMPANY: | USNRC | Facsimile: | win: 284-4887<br>outside: (412)374-4887 |
| LOCATION: | | | |

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WIN: 284-5125 (Janice) or Outside: (412)374-5125.

COMMENTS:

DIANE

THIS MARKUP SHOULD RESOLVE ITEM 1172 FROM OUR 2/20/97 TELECON. I WILL CHANGE W STATUS TO CLOSED AGAIN.

THIS WILL GO INTO REVISION 12 OF SSAR UNLESS WE HEAR FROM YOU.

Jim Winters

cc: LINDGREN
MCINTYRE
CUMMINS
WINTERS
RON VIJUK
ISRAELSON
JEANNE EVANS

| Criteria Section | Referenced Criteria | AP600 Position | Clarification/Summary Description of Exceptions |
|---|---|---|---|
| C.5.1.3 | | Conforms | The construction and inspection requirements of AISC-1989 and ACI 318-89 are followed as appropriate. |
| C.5.2 | Regulatory Guides 1.60 & 1.61 Table 1 | Exception | Those portions of the radwaste systems that require seismic design by Regulatory Guide 1.143 are housed in the auxiliary building that is Seismic Category I. Certain portions that do not require seismic design (for example, dry solid radwaste storage) are housed in the radwaste building, which is nonseismic. |
| C.5.3 | | Conforms | Shield structures, if used, will comply with Regulatory Guide 1.143, position C.5.2. |
| C.6 | ANSI N199-1976/ ANS-55.2 | Conforms | ~~The quality assurance program, as outlined in Chapter 17 of the standard safety analysis report and applied to the radwaste systems, meets the requirements of Regulatory Guide 1.143, position C.6.~~ |

REPLACE WITH INSERT 1A-71-1

**Reg. Guide 1.144 - Withdrawn**

**Reg. Guide 1.145, Rev. 1, 11/82 - Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants**

| | | | |
|---|---|---|---|
| General | | N/A | The atmospheric dispersion factors for use in determining potential accident consequences are selected to be representative of existing nuclear power plant sites and to bound the majority of them. Chapter 2 provides the interface criteria. Therefore, this regulatory guide is not applicable to AP600 design certification. |

**Reg. Guide 1.146 - Withdrawn**

**Reg. Guide 1.147, Rev. 8, 11/90 - Inservice Inspection Code Case Acceptability ASME Section XI Division 1**

| | | | |
|---|---|---|---|
| General | ASME Code, Section XI | Conforms | |

The monitor is an extended range monitor that uses a gamma-sensitive ion chamber. The monitor range and principal isotopes are listed in Table 11.5-2.

**Technical Support Center Area Monitor**

The Technical Support Center is the location from which engineering support will be provided to the operators following a postulated accident. The Technical Support Center area radiation monitor (RAMS-JE-RE016) is located so that its readout is representative of the radiation to which the support personnel are exposed. A local readout, an audible alarm, and visual alarms are provided locally to alert personnel to increasing exposure rates. A local readout, an audible alarm, and visual alarms are provided outside of the room and are visible to personnel prior to entry. Indication and alarms are also provided in the main control room.

The monitor is a normal range monitor that uses a gamma-sensitive Geiger-Mueller tube. The monitor range and principal isotopes are listed in Table 11.5-2.

### 11.5.6.3 Normal Range Area Monitors

Normal range area radiation monitors are located in accordance with the location criteria given in subsection 11.5.6.1. A local readout, an audible alarm, and visual alarms are provided in each monitored area to alert operating personnel to increasing exposure rates. Visual alarms are provided outside of each monitored area so that they are visible to operating personnel prior to entry. Indication and alarms are also provided in the main control room.

The monitor detectors are gamma-sensitive Geiger-Mueller tubes. The monitors and their ranges are listed in Table 11.5-2.

### 11.5.6.4 Quality Assurance

REPLACE WITH INSERT 11.5-17-1

Guidance for the quality assurance program for design, procurement, fabrication and installation issues is outlined in Section 17.1.

### 11.5.7 Combined License Information

The Combined License applicant will develop an offsite dose calculation manual that contains the methodology and parameters used for calculation of offsite doses resulting from gaseous and liquid effluents. The Combined License applicant will address operational setpoints for the radiation monitors and address programs for monitoring and controlling the release of radioactive material to the environment, which eliminates the potential for unmonitored and uncontrolled release. The offsite dose calculation manual will include planned discharge flow rates. The Combined License applicant is responsible for the site-specific and program aspects of the process and effluent monitoring and sampling per Regulatory Guides 1.21 and 4.15. The Combined License applicant is responsible for addressing the 10 CFR 50, Appendix I guidelines for maximally exposed offsite individual doses and population doses via liquid and gaseous effluents.

## INSERT 1A-71-1

The quality assurance program for design, fabrication, procurement, and installation of radwaste systems is in accordance with the overall quality assurance program described in Chapter 17, which meets the requirements of Regulatory Guide 1.143, position C.6.

## INSERT 11.5-17-1

The quality assurance program for design, fabrication, procurement, and installation of the radiation monitoring system and radiation monitors from other systems is in accordance with the overall quality assurance program described in Chapter 17.

Westinghouse

# FAX COVER SHEET

| RECIPIENT INFORMATION | | SENDER INFORMATION | |
|---|---|---|---|
| DATE: | February 21, 1997 | NAME: | Jim Winters |
| TO: | Diane Jackson | LOCATION: | ENERGY CENTER - EAST |
| PHONE: | FACSIMILE: | PHONE: | Office: 412-374-5290 |
| COMPANY: | US NRC | Facsimile: | win: 284-4887<br>outside: (412)374-4887 |
| LOCATION: | | | |

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**WIN: 284-5125 (Janice) or Outside: (412)374-5125.**

**COMMENTS:**

Diane

THIS MARKUP SHOULD RESOLVE ITEM 7.a(7) of your 10/11/96 letter, 7.a.7 of OUR 11/14/96 TELECON AND OITS # 264. IT SHOWS THE CORRELATION BETWEEN VBS AND THE SRP. THE ONLY SSAR CHANGE IS THE WORD "prefilter" ON PAGE 9.4-14. IT WILL GO INTO SSAR REVISION 12 UNLESS WE HEAR FROM YOU. NO NEW TABLE IS REQUIRED.

Jim Winters

cc Lindgren
McIntyre
Cummins
Ron Vijuk
Winters
Hutchings
Jeanne Cumins.

TABLE 6.5.1-1 Minimum instrumentation, readout, recording and alarm provisions for ESF atmosphere cleanup systems

References: ANSI N509 and Regulatory Guide 1.52

| | Sensing location | Local readout/alarm | Continuously manned control panel (main control room or auxiliary control panel if manning is a tech spec requirement) |
|---|---|---|---|
| A | Unit inlet or outlet | Flow rate (indication) | Flow rate (recorded indication, high alarm and low alarm signals) |
| B | Demister | Pressure Drop (indication) (optional high alarm signal) | |
| C | Electric heater | Status indication | |
| D | Space between heater and prefilter | Temperature (indication, high alarm and low alarm signals) | Temperature (indication, high alarm, low alarm, trip alarm signals) |
| E | Prefilter | Pressure drop (indication, high alarm signal) | |
| F | First HEPA (Pre-HEPA) | Pressure drop (indication, high alarm signal) | Pressure drop (recorded indication) |
| G | Space between Adsorber and second HEPA (Post-HEPA) | Temperature (two stage high alarm signal) | Temperature (indication, two-stage high alarm signal) |
| H | Second HEPA (Post-HEPA) | Pressure drop (indication, high alarm signal) | |
| I | Fan | (Optional hand switch and status indication) | Hand switch, status indication |
| J | Valve/damper operator | (Optional status indication) | Status indication |
| K | Deluge valves | Hand switch, status indication | Hand switch, status indication |
| L | System inlet to outlet | | Summation of pressure drop across total system, high alarm signal |

monitoring, and therefore requires no nuclear safety evaluation. Redundant safety-related isolation dampers are provided in the supply, return, and exhaust ducts penetrating the main control room. Therefore, there are no single active failures which would prevent isolation of the main control room envelope. Redundant main control room supply air radiation monitors are provided. The nuclear island nonradioactive ventilation system is designed so that safety-related systems, structures, or components are not damaged as a result of a seismic event.

### 9.4.1.4 Tests and Inspections

The nuclear island nonradioactive ventilation system is designed to permit periodic inspection of system components. Each component is inspected prior to installation. Components of each system are accessible for periodic inspection during normal plant operation. A system air balance test and adjustment to design conditions is conducted in the course of the plant preoperational test program. Airflow rates are measured and balanced in accordance with the guidelines of SMACNA HVAC systems, Testing, Adjusting and Balancing (Reference 19) except the supplemental air fultration units which are balanced in accordance with the guidelines of ASME N510 (Reference 3). Instruments are calibrated during testing. Automatic controls are tested for actuation at the proper setpoints. Alarm functions are checked for operability.

The supplemental air filtration unit, HEPA filters, and charcoal adsorbers are field tested in accordance with ASME N510 to verify that these components do not exceed a maximum allowable bypass leakage rate. Used samples of charcoal adsorbent are periodically tested to verify a minimum charcoal efficiency of 90 percent in accordance with Regulatory Guide 1.140, except that test procedures and test frequency are conducted in accordance with ASME N510.

The ductwork for the supplemental air filtration subsystem and portions of the main control room/technical support center HVAC subsystem that maintain the integrity of the main control room/technical support center pressure boundary during conditions of abnormal airborne radioactivity are tested for leak tightness in accordance with ASME N510, Section 6.

### 9.4.1.5 Instrumentation Applications

The nuclear island nonradioactive ventilation system is controlled by the plant control system except for the main control room isolation dampers, which are controlled by the protection and safety monitoring system. Refer to subsection 7.1.1 for a description of the plant control and plant safety and monitoring systems.

Temperature controllers are provided in the return air ducts to control the room air temperatures within the predetermined ranges. Temperature indication and alarms for the main control room return air, Class 1E electrical room return air, air handling unit supply air, supplemental filtration unit inlet air and charcoal adsorbers are provided to inform plant operators of abnormal temperature conditions.

(K) No Deluge Valves
(B) No Demisters
prefilter
(D)
(G)

E F H

Pressure differential indication and alarms are provided across each filter bank (except charcoal filters) to inform plant operators when filter changeout is necessary. Pressure differential indication and alarms are provided to control the main control room and monitor the technical support center ambient room pressure differentials with respect to surrounding areas.

L

Radioactivity indication and alarms are provided to inform the main control room operators of gaseous, particulate, and iodine radioactivity concentrations in the main control room supply air duct. See Section 11.5 for a description of the main control room supply air duct radiation monitors and their actuation functions.

Smoke monitors are provided to detect smoke in the outside air intake duct to the main control room and the main control room and Class 1E electrical room return air ducts.

A

Airflow indication and alarms are provided to monitor operation of the supply and exhaust fans.

Relative humidity indication and alarms are provided to monitor the average relative humidity in the return air from the main control room/technical support center areas and the inlet air to the supplemental air filtration unit charcoal filters.

I C J

Status indication is provided to monitor ~~fans~~, heaters and ~~controlled~~ dampers.

### 9.4.2 Annex/Auxiliary Buildings Nonradioactive HVAC System

The annex/auxiliary buildings nonradioactive HVAC system serves the nonradioactive personnel and equipment areas, electrical equipment rooms, clean corridors, and demineralized water deoxygenating room in the annex building, and the main steam isolation valve compartments, reactor trip switchgear rooms, and piping and electrical penetration areas in the auxiliary building.

### 9.4.2.1 Design Basis

#### 9.4.2.1.1 Safety Design Basis

The annex/auxiliary buildings nonradioactive HVAC system serves no safety-related function and therefore has no nuclear safety design basis.

#### 9.4.2.1.2 Power Generation Design Basis

The annex/auxiliary buildings nonradioactive HVAC system provides the following specific functions:

- Provides conditioned air to maintain acceptable temperatures for equipment and personnel working in the area

Westinghouse

# FAX COVER SHEET

| RECIPIENT INFORMATION | | SENDER INFORMATION | |
|---|---|---|---|
| DATE: | FEBRUARY 21, 1997 | NAME: | JIM WINTERS |
| TO: | DIANE JACKSON | LOCATION: | ENERGY CENTER - EAST |
| PHONE: | FACSIMILE: | PHONE: | Office: 412-374-5290 |
| COMPANY: | USNRC | Facsimile: | win: 284-4887<br>outside: (412)374-4887 |
| LOCATION: | | | |

Cover + Pages 1 + 1

**The following pages are being sent from the Westinghouse Energy Center, East Tower, Monroeville, PA. If any problems occur during this transmission, please call:**

**WIN: 284-5125 (Janice) or Outside: (412)374-5125.**

COMMENTS:

DIANE

THIS MARKUP SHOULD RESOLVE ITEM ~~29~~ 239 FROM OUR 11/5/96 TELECON. IN ACCORDANCE WITH TELECON I WILL CHANGE NRC STATUS TO CONFIRM W. THIS WILL GO INTO SSAR REVISION 12 UNLESS WE HEAR FROM YOU.

cc: LINDGREN
MCINTYRE
CUMMINS
RON VIJUK
WINTERS
HUTCHINGS
JEANNE EVANS

Jim Winters

### 9.3.1.2 System Description

#### 9.3.1.2.1 General Description

Classifications of components and equipment in the compressed and instrument air system are given in Section 3.2. In accordance with NUREG-1275, instrument air quality meets the manufacturer's standards for pneumatic equipment supplied as a part of the plant. Intake filters for instrument air, service air, and high-pressure air compressors remove particulates 10 microns and larger.

**Instrument Air Subsystem**

100% capacity

The instrument air subsystem consists of two parallel air supply trains discharging to a common air distribution system. An air compressor, dryer, controls, and receiver comprise one air supply train. The two compressor trains join to a single instrument air header downstream of the receivers.

Provisions are made to temporarily cross connect the instrument and service air subsystems at the distribution header.

The instrument air line to the containment is normally open; however, air flow to the containment is monitored and a high flow alarm is provided to indicate a possible instrument air line rupture inside containment. Safety-related air-operated valves supplied by the system are identified in Table 9.3.1-1. None of these valves require instrument air to perform their safety-related function. The valves with an active safety-related function fail in the safe position on loss of instrument air pressure.

One instrument air compressor train, including its air dryer and associated equipment and controls, can be connected to each of the nonsafety-related onsite standby diesel generators. The compressors are cooled by water supplied from the component cooling water system (CCS). Refer to subsection 9.2.2 for details. The instrument air subsystem is shown schematically in Figure 9.3.1-1. Major system components are described in Table 9.3.1-2.

**Service Air Subsystem**

100% capacity

Two compressor trains are provided for the service air subsystem. These compressor trains consist of identical equipment and share a common air receiver that feeds the service air distribution system. Cooling water to the service air compressors is supplied from the component cooling water system. Refer to subsection 9.2.2 for details.

The service air line to containment is normally closed and is opened on an as-needed basis. The service air subsystem is shown schematically in Figure 9.3.1-1 and major system components are described in Table 9.3.1-3.

# FAX TO JOE SEBROSKY

February 24, 1997

cc: Dan McDermott
Brian McIntyre

SSAR subsection 6.2.4 (SSAR revision 11) includes hydrogen igniter placement information that was requested by the NRC to be placed into the SSAR during a meeting on August 13-14, 1996. A copy of what is in this subsection was faxed to NRC on 2/13/97 and 2/18/97.

The location of each igniter was provided to the NRC during the August 13-14, 1996 meeting. However, some of the locations have changed and two additional igniters have been provided since the August meeting. These changes are a result of NRC feedback during the August 1996 meeting and from an EPRI hydrogen igniter expert's review comments. The purpose of this fax is to summarize the changes to assist the NRC's review of SSAR subsection 6.2.4.

Changes to igniter locations include:

- Above the operating deck:
  - As a result of NRC feedback at the August 1996 meeting, igniters now provide coverage in the refueling cavity, and two igniters have been added to provide coverage within the IRWST.
  - Reoriented location of numerous igniters to move them away from the containment shell.

- Below the operating deck -- Some igniters were moved to place the igniters away from the containment wall.

- Igniters up in the dome were eliminated. Coverage is still provided in the dome, but down lower around the 210 ft elevation area, to concentrate on burning hydrogen at the release point.

Please call me if the staff has questions on igniter placements.

Thanks,

Cynthia Haag
412-374-4277