March 11, 2004

APPLICANT: Westinghouse Electric Company

PROJECT: AP1000 Standard Plant Design

SUBJECT: SUMMARY OF OCTOBER 30, 2003, CATEGORY 1 MEETING WITH WESTINGHOUSE ELECTRIC COMPANY TO DISCUSS SPECIFIC OPEN ITEMS ASSOCIATED WITH THE AP1000 DESIGN CERTIFICATION REVIEW

On October 30, 2003, a public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Westinghouse Electric Company (Westinghouse, the applicant), at NRC Headquarters in Rockville, MD. The purpose of this meeting was to discuss specific open items (OIs) from the NRC staff's June 16, 2003, draft safety evaluation report (DSER) concerning the AP1000 design certification review. A list of meeting attendees is included as Attachment 1.

Attachment 2 includes a summary of the discussion and resolution on some of the open item issues as stated in Chapter 1 of the AP1000 DSER which were discussed during this public meeting and other OIs not included in the DSER. The NRC staff and Westinghouse discussed a number of broad review topics which are summarized below. Attachment 3 contains a summary of unresolved materials open items. Attachment 4 contains a matrix of the status of all the DSER open items in the AP1000 design certification review as of the date of the public meeting.

Structural and Seismic Open Items

Westinghouse stated that they along with Chicago Bridge and Iron were investigating the feasibility of including studs on inside and outside of containment shell design to address the seismic margin level uplift issue. In addition, Westinghouse was working on several analytical approaches by accounting for area of floor mat and a better representation of the damping (increase to 10 percent as allowed in seismic margins). Westinghouse also said that they would review their calculations to consider the latest acceleration levels in combination with partial cracked concrete effects.

Inspection, Test, Analysis, and Acceptance Criteria (ITAAC)

With regard to the main control room χ/Q (atmospheric dispersion factors), the NRC staff stated that they needed to have further internal discussion as to what key features needed to be included in ITAAC. The staff committed to discuss this issue with Westinghouse after those discussions have been completed.

The NRC staff noted that ITAAC currently exist for the containment sump. However, in light of the current generic issues involving sump strainers, the staff needed to have further internal discussions to consider if these ITAAC were appropriate. In addition, the values included in the ITAAC need to be verified.

The NRC staff discussed an issue which was identified by the NRC team developing the construction inspection program for new reactors. In reviewing the AP600 ITAAC, a potential issue was identified concerning cable pulling and the fact that there was no ITAAC for this activity. After some discussion, it was concluded that there was no ITAAC in the AP1000 for cable pulling. Westinghouse stated that for operating plants, inspection is performed in process so this practice is identical to what would be done for the AP1000. The staff requested that Westinghouse further consider the inclusion of ITAAC for cable pulling and discuss this issue further with the staff. Westinghouse stated that they would provide the NRC with a written response and identify this as a meeting OI.

The staff also discussed three issues involving the AP1000 design control document (DCD) Tier 1, Section 1.2, "General Provisions." These issues include the following:

1) Where the phrase "report exists and concludes that..." (note that sometimes this phrase doesn't always state concludes that) is used, the document has to demonstrate that a design commitment has been met. The NRC staff requested Westinghouse to consider that, in a situation where the COL applicant would have to perform an analysis, the DCD be modified to state that they have met design commitment and that it is complete. Westinghouse stated that they will review the DCD and get back with the staff.

2) The NRC staff and Westinghouse discussed the appropriateness of cross-referencing ITAACs, where one ITAAC refers to another ITAAC, and concluded that this was acceptable.

3) With regard to the heading of the middle column of the ITAAC table, this implies that the NRC will perform an inspection for the existence of a report. In reality, the applicant will be performing a test or analysis. The NRC staff questioned if the DCD is it written such that the COL applicant can identify the appropriate activity. Westinghouse stated that this logic is pervasive in all ITAACs and therefore is not an issue. Westinghouse suggested that the explanation be clarified further. NRC agreed with this approach and suggested guidance be provided to ensure that when these words are used, the COL applicant will be required to perform a test or analysis.

<u>Reactor Systems Issues Impacted by Response to Open Item 5.3.3-1</u>

The NRC staff discussed with Westinghouse several issues related to their response to OI 5.3.3-1. Westinghouse committed to perform the following actions:

- Revise DCD Tier 1, Table 2.3.6-4, Item 9a to address the change to the low temperature overpressure protection (LTOP) limit on the ITAAC.

- Revise the response to OI 5.3.3-1 to discuss the impact of the changes on the Revision 1 response to RAI 440.036.

- Review Revision 1 to WCAP-14040 to determine if the revision impacts the DCD.

Sump Strainer Open Items

The NRC staff stated that they were not ready to close out the remaining OIs in this area. The staff discussed several concerns as follows:

The NRC staff noted that Revision 3 to Regulatory Guide (RG) 1.182 was scheduled to be issued as a draft for public comment in the near future. This draft would include a discussion of the chemical effects of the plugging of sump screens. The NRC staff stated that it plans to open a new OI for the AP1000 review asking Westinghouse to evaluate the effects of metal precipitation. Westinghouse stated that they would prefer the OI be issued immediately. The NRC staff agreed to issue an OI before the RG was issued.

Westinghouse stated that the design approach for the AP1000 has unique features to address the sump issues discussed above. These include: (1) a deep flood up of the reactor cavity; (2) recirculation does not occur until 2 ½ hours after initiation of flow; (3) low flow velocities; (4) no wash-down of upper containment; (5) no fiberglass insulation subjected to damage by a loss-of-coolant accident jet; (6) sump screens include a shield plate to prevent paint chips from reaching the screens; and (7) bottom of the sump screen is approximately one-foot off the wall.

NRC will arrange a conference call in mid-November on 3 open items and will try to issue new OIs on chemical effects as appropriate, (1) thin bed effect [Westinghouse to respond], (2) containment sump [NRC will provide comments by 11/13], and (3) chemical precipitation [NRC will try to put OI together knowing that draft RG is out for public comment]. Westinghouse wants to understand the issues before performing additional calculations.

Members of the public were in attendance. One comment was made by the public concerning the current effort to issue a revision to the RG concerning chemical effects and that it appears that the NRC is going to make licensees perform another research project.

Westinghouse's responses to OIs 2.3.4-1, Revision 2 and 14.2-1.t were handed out during the meeting, these can be found in the Agencywide Documents Access and Management System (ADAMS) ML040680686 and ML040680683.

Please direct any inquires concerning this meeting to Joseph Colaccino at 301-415-2753, or jxc1@nrc.gov.

/RA/

Steven D. Bloom, Project Manager
New Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 52-006

Attachments:
1. List of attendees
2. AP1000 Open Items discussed during October 30, 2004, Meeting
3. Summary of Unresolved Materials DSER Open Items
4. Summary of DSER Open Item Tracking List

cc w/ atts: See next page

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ML040690106-Pkg.
ML040680683 and ML040680686-Enclosures
ML040690131-Meeting Summary

ADAMS ACCESSION NUMBER:ML040690106-Pkg.

OFFICE	PM:RNRP	SC:RNRP
NAME	SBloom	LDudes
DATE	3/9/04	3/11/04

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Distribution for October 30, 2003, Meeting Summary dated March 11, 2004

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MHart	JBongarra	SSheng	SSun	CAder	JRava
CGraham	GImbro	HWalker			

NRC PUBLIC MEETING ATTENDANCE LIST
AP1000 DRAFT SAFETY EVALUATION REPORT
OPEN ITEM MEETING
OCTOBER 30, 2003

Name	Representing
E. Cummins	Westinghouse Electric Corporation (Westinghouse)
T. Schulz	Westinghouse
R. Vijuk	Westinghouse
M. Corletti	Westinghouse
D. Weisman	Westinghouse
G. Twachtman	McGraw-Hill
E. Oesterle	Bechtel Power Corporation
J. Colaccino	U. S. Nuclear Regulatory Commission (NRC)
J. Starefos	NRC
J. Segala	NRC
J. Wilson	NRC
G. Bagchi	NRC
T. Cheng	NRC
K. Coyne	NRC
L. Brown	NRC
B. Harvey	NRC
E. Sullivan	NRC
P. Sekerak	NRC
D. Terao	NRC
R. Pettis	NRC
R. MCintyre	NRC
J. Pulsipher	NRC
D. Cullison	NRC
G. Hsii	NRC
N. Saltos	NRC
B. Musico	NRC
R. Architzel	NRC
D. Barss	NRC
M. Mitchell	NRC
G. Chervenki	NRC
B. Elliot	NRC
C. Lauron	NRC
J. Dreisbach	NRC
N. Iqbal	NRC
A. Keim	NRC
L. Lois	NRC
P. Negui	General Electric
M. King	Numark Associates

Westinghouse Personnel Participating by Phone

T. Meneely	J. Grover
D. Wiseman	R. Gold
L. Tunou-Sanjur	K. Accornero
D. Bhowmick	R. Wright
T. Audreychek	J. Scobel
S. Sancaktar	R. Kemper
Y. J. Lin(Bechtel)	B. Singhal(Bechtel)

Attachment 1

AP1000 OPEN ITEMS AND DISCUSSIONS AT OCTOBER 30, 2003 PUBLIC MEETING

Open Items included on the Meeting Agenda

OI 2.3.4-1 A review of the hypothetical reference control room χ/Q values calculated by the applicant has identified unresolved issues related to adequate justification for assuming a diffuse release, estimation of initial sigma values, other release assumptions, building cross-sectional areas, and distances between release/receptor pairs.

Westinghouse's approach is to use ARCON 96 in compliance with Regulatory Guide (RG) 1.194. The release paths were previously through the auxiliary building. Westinghouse is now looking at other external release points, such as the passive containment cooling system chimney, and they are looking at diffuse releases. Bechtel performed a calculation to find various χ/Q (atmospheric dispersion factors) values, and then conservatively back calculated χ/Q. They have gotten positive results in all cases. Table 15A-6 of the DCD contains calculated release points and confirmation that the actual χ/Q is lower than all of those in the main control room (MCR). The NRC staff stated that our approval of Table 15A-7 depends on our approval of the inputs to ARCON. The NRC staff asked the following questions:

(1) Wanted to understand a release from a steam line break through the steam vent (trying to match Table 15A-6 to Table 15A-7)? Westinghouse stated that a steam line event is break of main steam line not a steam venting evolution

(2) In Table 15A-7, is the straight line distance, the horizontal distance? Westinghouse stated it was and would change title to horizontal straight line distance.

(3) The tables are for the MCR, do they apply to the technical support center (TSC)? Is this part of main control room envelope? Westinghouse stated that the same air quality in the MCR as in the TSC.

3.6.3.4-2 This open item concerning leak-before-break (LBB) piping system analysis will be included in a supplement to the DSER.

The NRC staff stated that the latest revision addressed the question on the comparison of response spectra between the AP600 and the AP1000. The NRC staff stated that this adds another degree of confidence that ADS-4 can be qualified for LBB. The NRC asked about the pipeline diameter effects. Westinghouse stated that a moment in pipe is proportional to moment of inertia. The NRC staff asked if the effect shouldn't be to the 4^{th} power? Westinghouse will look at the stiffness and also proportionality to length. Westinghouse stated that they didn't put every step into analysis. The NRC staff stated it was concerned about peak-to-peak vs peak-to-valley issues. The NRC staff asked how much information is necessary to resolve LBB for design certification,

especially since the ADS-4 is critical to the resolution. The NRC staff stated that they didn't want to have to reroute because would have to reopen entire thermohydraulic issue. NRC staff felt that Westinghouse only selected two critical lines, but other lines have to be considered.

The NRC staff stated that the direct vessel injection (DVI) A line calculation has not been sent. Westinghouse asked if the NRC staff want to audit calculation, since the results summary presented in addendum. The NRC staff stated that it was not necessary to have calculation submitted or for us to do an audit but, wanted to have a discussion submitted on how analysis was performed. Westinghouse stated that there is briefly discussed in the addendum but the NRC staff stated that it would like the discussion expanded. NRC wanted to make sure that the design acceptance criteria and stresses were consistent. Westinghouse will expand addendum.

3.8.2.1-1 The staff expected that the final detailed analyses for the AP1000 steel containment would be submitted for staff review as part of the design certification process. To complete the staff evaluation of the AP1000 steel containment design, the staff will need to audit the final detailed analyses.

This open item was not discussed during the public meeting.

3.8.3.5-2 The design summary report for containment internal structures documenting that the structures meet the acceptance criteria has not been completed. Therefore, the staff has not perform its review of the report.

This OI was confirmatory pending review of Westinghouse's conciliatory report. (Internal structure report and reconciliation calculations for design and DCD revision 8).

3.8.4.2-1 The need for boundary elements around openings and at intersections of reinforced concrete walls should be evaluated in accordance with Chapter 21.6 of ACI-349-01.

This OI was not discussed during the public meeting.

3.8.4.5-2 During the review of the Wall 7.3 design calculation, the staff could not conclude that the corrected equation accurately calculates the necessary positive reinforcement.

This OI was not discussed during the public meeting.

4.5.1-2 The COL applicant should perform analyses and inservice inspections and provide reports and notifications equivalent to those contained in Sections IV.A to IV.F of NRC Order EA-03-009, "Interim Inspection Requirements for Reactor Pressure Vessel Heads at PWRs."

The NRC staff stated that they wanted Westinghouse to refer to Order EA-03-009. Westinghouse will revise the DCD.

6.2.1.8.2-1 Westinghouse should justify the analysis used to determine the capability of the AP1000 in containment refueling water storage tank screens to accommodate anticipated debris loadings.

This OI was not discussed during the public meeting.

6.2.1.8.3-1 Westinghouse did not address the potential for other sources of debris, such as fibrous debris and floatable debris, to enter the reactor coolant system through a pipe break and block requisite core cooling flowpaths.

This OI was not discussed during the public meeting.

6.2.1.8.3-2 Westinghouse should support the assumption that paint particles smaller than 200 mils are not a blockage concern for the containment recirculation screens.

The NRC staff stated that this issue is considered resolved.

6.2.1.8.3-3 Westinghouse should justify the analysis associated with the capability of the AP1000 containment recirculation screens to accommodate anticipated debris loadings.

This OI was not discussed during the public meeting.

6.2.5-1 The AP1000 design control document for the control of combustible gas in containment during accidents does not comply with current regulations.

Westinghouse stated that the rule change takes care of almost everything. The NRC staff asked about the requirement to have a mixed atmosphere for control room hydrogen. Westinghouse stated that in the AP600 for atmospheric mixing there were 2 small quarter size passive autocatalytic recombiners (PARs) in the in-containment reactor water storage tank (IRWST) and chemical and volume control system (CVS) compartments. The NRC staff stated that In the AP1000 those 2 PARs have to be removed. Westinghouse stated that they responded to this in original RAI 480.001. The hydrogen ignitor details and locations are in DCD Tier 2 Section 6.2.4

Westinghouse asked what plant condition is not evaluated. The NRC staff stated that the rule change states that original design basis for hydrogen is no longer valid, and that Westinghouse needs to evaluate for more severe accidents. Westinghouse stated that with the ignitors in both the IWRST and CVS compartments, they didn't take credit for PARs in design basis accidents, but only for severe accidents. The NRC staff stated that if there are ignitors, then OI 6.2.5-1 and 14.3.2-6 are considered resolved.

14.2-1 While the staff has completed its review of whether the Initial Test Program conforms to specified RGs and certain other matters, as discussed below, the staff has not completed its review of certain aspects of the testing scope, general test methods, and acceptance criteria.

The NRC staff stated that sub-item aa revised response is acceptable. The NRC staff wants to have added to the revision a reference to preoperational testing which is to be included in last paragraph of section 3.9.3 of DCD. The NRC staff was satisfied that this can be resolved without adding an additional ITAAC. Westinghouse agreed to revise the DCD.

Sub-items a-s, w-z, bb are also considered closed.

Sub-item t response was not included in the package, which relates to nuclear instrumentation system verification testing.

Sub-item u is still under review.

Sub-item v, related to natural circulation testing. This is an exception to the RG, since the steam generators are not the path, since they are using IRWST. The NRC staff asked if Westinghouse has considered doing testing to verify that equipment is working effectively. Westinghouse stated that the passive residual heat removal system (RHR) is tested in another way, via a passive cooling RHR test. The NRC staff will review the passive core cooling RHR test.

15.2.7-1 The information provided regarding core void distribution was not sufficiently detailed to draw the conclusion that adiabatic heating would be avoided. The applicant should provide more detailed information of the axial void distribution during LTC and show that the possibility of adiabatic fuel heating is excluded.

17.3.2-1 The NRC staff plans to perform a quality assurance (QA) test control implementation inspection to determine if additional testing activities performed at the test facility associated with the AP1000 design are accomplished, in accordance with the Westinghouse 10 CFR Part 50, Appendix B, QA program as described in Chapter 17 of the AP1000.

The NRC staff performed an inspection at Oregon State University, but it was not appropriate to discuss the inspection of another vendor without the vendor present. The inspection report is scheduled for a mid-November issuance.

17.3.2-2 The staff plans to conduct an inspection of the implementation of the project-specific quality plan to verify that design activities conducted for the AP1000 project complied with the Westinghouse QMS and the requirements of 10 CFR Part 50, Appendix B.

The inspection report is about to be issued. The NRC staff provided open item to allow Westinghouse to generate response. Westinghouse is formulating plans to address OI regarding the qualification of suppliers outside of

Westinghouse and that they meet the Appendix b requirements. Westinghouse understands issue.

19.1.10.1-5 Westinghouse should address issues associated with its approach in categorizing success paths for the PRA.

The NRC staff does not have issues except for the containment pressure calculation for long term cooling.

19A.2-8 Westinghouse should address the necessity for a review of the core makeup tank, high confidence that the particular structures, systems and components (SSC) will have a low probability of failure (HCLPF) value if there is any increase in seismic response of the containment internal structure due to lift off of the internal structure or the nuclear island structure.

This OI was not discussed during the public meeting.

20.7-1 Bulletin 2002-01, “Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity.” Westinghouse needs to provide information to describe the extent to which the insulation of all Alloy 600/690 components and welds in the reactor coolant pressure boundary (not just upper reactor vessel head penetrations) will be designed to readily facilitate bare metal visual inspection during refueling outage conditions.

NRC provided rewritten words for the DSER. When a licensee builds a plant, they will need to verify. Westinghouse was not sure that they had a COL item but will put a COL item in chapter 5 of the DCD.

Westinghouse asked NRC to review COL action items in Chapter 5.3.6. Table 5.3-1, and 5.3-3 contains maximum limits for elements of the reactor vessel and upper shelf energy, respectively. The projected neutron fluence is not included in the DCD. Westinghouse stated that a P-T curve is in the DCD. The NRC staff stated that fuel design changes may make fluid changes. Westinghouse will modify the DCD Tier 2 Section 5.3.6.4 to include projected neutron fluence.

21.5-1 The applicant's submittals and responses to RAIs concerning hot leg phase separation were not sufficient to demonstrate that the codes used in the AP1000 safety analysis model the hot leg phase separation process correctly. This issue is considered open until the applicant confirms the sensitivity studies performed by the staff using the code(s) the applicant intends to use to model SBLOCAs in the AP1000.

This OI was not discussed during the public meeting.

21.5-2 Given the lack of well scaled experimental data on upper plenum entrainment phenomena and the importance of predicting this process in an advanced plant SBLOCA transient, the staff has requested new experimental data to support the use of the upper plenum entrainment models in the AP1000.

This OI was not discussed during the public meeting.

21.5-3 Additional justification that the AP1000 core will remain covered as predicted by the codes should be provided since high void fractions were predicted.

This OI was not discussed during the public meeting.

Open Items not Included on the Meeting Agenda

OI 9.5.1-1 The NRC staff reviewed revision 1, addendum A response, and determined that it needs more clarification for items b and c. For item b, the COL applicant must provide test results for material that they used in the different configurations and different designs. Westinghouse agreed to revise the DCD to add a COL item. For item c, since the passive containment cooling system valve room contains safety related equipment, access to the room for fire protection is necessary. Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5.1 Section C.6.c.4. states that Westinghouse will need to provide hose line access to any safety related equipment. Westinghouse will try to put a hose line access there but if not then we will ask for exception to BTP.

OI 14.2.10-1 This is a construction issue, need to verify that the assembly has been done correctly. The RAI responses focused on code validation.

OI 14.2.10-2 There were no additional questions on this OI; it is currently under review.

OI 14.2.10-3 The NRC staff stated that the RG 1.168 rod-out-of-position test should be performed at the technical specification limits. The NRC staff stated that the response focused on code and was concerned if this covers if the facility is adequately constructed. The NRC staff stated that RG test should be done at 50 and 100 percent power, however, the DCD has the test performed at 30 and 50 percent range, and there is no technical justification for not performing the test at 100 percent.

OI 14.2.10-4 The same concern as in 10-1 and 10-2, the test needs to be performed for an SSC evaluation.

OI 19.1.10.1-2 The NRC staff reviewed the response which included COL action items to address 19.1.10.1-6. Westinghouse proposed to add item 80 in the PRA table. Westinghouse stated that it is already in DCD 9.5.1.8. The NRC staff stated that they verified that it is in the DCD, however, the COL action item may require some adjustments.

The NRC staff discussed potential insight from closing OI 19.1.10.1-4 related to low cycle fatigue (LCF) sequences. Westinghouse provided revision 1 response on September 29, 2003, related to human actions. The NRC staff stated that there should be a COL action item associated with operator actions. Item 79 in list of PRA insights will provide resolution of generic issues. The NRC staff asked if Westinghouse had certified. Westinghouse stated that this item did not provide functionality. The NRC staff will review the wording of item 79.

OI 19.1.10.1-3 The NRC staff believes they have enough information to support an FSER input, however, they may have additional questions, so the item will be kept open.

Open Items not included in AP1000 DSER

OI 5.2.3-3 The NRC staff still needs to discuss this OI internally and will schedule a conference call in about one week. The NRC staff would like a person who will be responsible for part D to be in on the call. Westinghouse's comment does not have anything to do with an ACRS question. This is not an issue.

OI 5.2.3-2 The NRC staff review of the weld application questions the actual weld specifications, since 52/152 is not the easiest thing to weld. Westinghouse stated that they would go back and provide a more comprehensive response to the questions. The NRC staff asked that a QA and weld process person be in on the next call. The NRC staff stated that inspections performed are only in accordance with those of the ASME Code. The South Texas experience did not pick this up, therefore, the inspections need to be done above the Code. The NRC staff asked about the difference between 52 and 152 weld materials. Westinghouse stated that the U.S. Navy uses 52 more than 152. Westinghouse's process uses either. The root pass of the J-groove weld uses 52 on the first pass and 152 as filler. Westinghouse will make any changes in 5.2.3 of DCD.

OI 14.2-1f The NRC staff asked how does startup program address the steam generators? Westinghouse stated that they have drafted a response, which will deal with the primary and secondary side.

AP1000 DSER OPEN ITEM PUBLIC MEETING
OCTOBER 30, 2003
UNRESOLVED MATERIALS OPEN ITEMS

(Note: open items (OIs) marked with an asterisk (*) were issued after June 16, 2003, and are not included in the AP1000 draft safety evaluation report (DSER))

Open Item 5.2.3-3*

High-chromium nickel-based alloys (e.g., Alloy 690/52/152, as well as 82/182) may be susceptible to a significantly lowered fracture toughness if they have been exposed to high temperature hydrogenated water and then stressed at low temperature (e.g., < 120 C).

Westinghouse response is dated September 8, 2003. To evaluate open item staff needs response to follow up questions transmitted this week.

a. Provide the H_2 concentration of the reactor coolant at normal plant operating conditions.

b. For a simulated Pressurized Thermal Shock transient, what temperature levels would the most susceptible bi-metallic welds reach? What bi-metallic welds in the reactor coolant system would experience the most significant cooldown effect?

c. Provide a schematic drawing of welds at these locations. For example, describe whether these welds would consist of Alloy 52 material through the entire wall, or Alloy 52 in contact with the reactor coolant and Alloy 82/182 for the remainder of the wall thickness.

d. Assume a small ID surface breaking flaw in the bi-metallic welds identified in parts b. and c. above. Evaluate what conditions and effects the flaw would see as a result of a simulated Pressurized Thermal Shock transient (i.e., hydrogen concentration, final temperature, loading rate, and failure potential).

Open Item 5.2.3-2*

Alloy 52/152 materials are known to be difficult to weld. Address what examinations have been given to the adequacy of QA criteria of the Alloy 52/152 weldments. Address whether the QA criteria are commensurate with the risk associated with weldment failure.

Westinghouse response is dated September 8, 2003.

Response does not directly answer requests.

Response indicates difficulties with SMA process using Alloy 152. Westinghouse should clarify limitations that will be placed on use of Alloy 152, such as use only on joints where access is an issue.

Response appears to be written for butt weldments rather than for both butt welds and partial penetration welds (e.g., J-groove welds).

Response does not incorporate South Texas experience with lack of fusion in vessel bottom head penetration J-groove weld.

Westinghouse should address inspections that will be performed to identify potential lack of fusion in partial penetration welds, for example volumetric examination, final pass eddy current examinations, or additional weld pass surface examination and address acceptance criteria.

Open Item 4.5.1-2

COL applicant should perform analyses and inservice inspections and provide reports and notifications equivalent to those contained in Sections IV.A to IV.F of NRC Order EA-03-009, "Interim Inspection Requirements for Reactor Pressure Vessel Heads at PWRs."

By letter dated June 23, 2003, Westinghouse indicated that the DCD would be changed.

The DCD change only addresses the inspections and does not address the activities related to susceptibility calculations, categorization, and preparation of reports and notifications.

Open Item 14.2-1.f*

DSER OI 14.2-1.f states, "The staff requested that Westinghouse identify whether during the initial test program the COL applicant will monitor (e.g., acoustic monitoring) the primary and secondary sides of the steam generator for indications of loose parts or anomalous internals vibration that can lead to tube degradation."

Westinghouse responded that a digital metal impact monitoring system monitors the reactor coolant system for metallic loose parts. The system is installed on the primary side of the steam generator. The capability of this system to monitor the secondary sides of the steam generator for either loose parts or anomalous internals vibration is not addressed.

Open Item 20.7-1

DSER on Generic Letter (GL) 92-01, Rev. 1 and GL 92-01 Rev. 1, Supplement 1, " Reactor Vessel Structural Integrity concluded that the COL applicant should provide the information requested in GL 92-01, Rev 1, and GL 92-01, Rev 1, Supplement 1 - COL Action Item 20.7-11.

Revised input for COL Action Item 20.7-11indicates GL 92-01, Revision 1, Supplement 1, "Reactor Vessel Structural Integrity," requested all licensees to perform a review of their reactor pressure vessel structural integrity assessments in order to identify, collect, and report any new

data pertinent to the analysis of the structural integrity of their reactor pressure vessels (RPV) and to assess the impact of that data on their RPV integrity analyses.

The staff is requesting that the applicants of the AP1000 design, as part of its actual plant submittal, provide the following information with regards to reactor vessel integrity: the amount of copper, nickel, and phosphorus contents, the initial RT_{NDT} value, the projected fluence at the end of the license period for the limiting material, and the method of calculating the fluence. This information will provide confirmation to the staff that the proposed pressure-temperature limits are in accordance with Appendix G of 10 CFR Part 50 and that the beltline materials conform to the PTS criteria of 10 CFR 50.61.

AP1000 DRAFT SAFETY EVALUATION REPORT
OPEN ITEM SUMMARY
OCTOBER 30, 2003

OI No.	Open	Confirm	Resolve
1.1-1	1		
1.9-1	1		
1.10-1	1		
2.3.4-1	1		
2.5.1-1		1	
2.5.2-1			1
2.5.4-1			1
2.5.4-2		1	
2.5.4-3			1
3.3.1-1		1	
3.3.1-2		1	
3.3.2-1		1	
3.3.2-2		1	
3.3.2-3			1
3.5.1.3-1			1
3.5.1.3-2			1
3.6.3.4-1	1		
3.6.3.4-2	1		
3.7.1.5-1		1	
3.7.2.1-1			1
3.7.2.3-1		1	
3.7.2.3-2		1	
3.7.2.3-3		1	
3.7.2.9-1		1	
3.7.2.16-1		1	
3.8.2.1-1	1		
3.8.2.2-2			1
3.8.3.5-1			1
3.8.3.5-2	1		
3.8.3.5-3		1	
3.8.4.2-1	1		
3.8.4.3-1		1	
3.8.4.5-1		1	
3.8.4.5-2	1		
3.8.5.1-1		1	
3.8.5.4-1			1
3.8.5.4-2			1
3.8.5.4-3			1
3.8.5.5-1			1
4.4-1			1
4.5.1-1	1		
4.5.1-2			1
5.2.3-1			1
5.3.3-1			1
5.4.2-1			1
6.1.1-1			1
6.2.1.8.1-1			1
6.2.1.8.2-1	1		
6.2.1.8.3-1	1		
6.2.1.8.3-2	1		
6.2.1.8.3-3	1		
6.2.5-1	1		
6.2.6.4-1		1	
6.4-1	1		
8.2.3.1-1			1
9.4-1			1
9.5.1-1	1		
9.5.1-2	1		
9.5.2-1			1
9.5.2-2	1		
9.5.2-3		1	
9.5.2-4			1
10.2.8-1			1
10.2.8-2			1
10.2.8-3			1
13.3-1		1	
13.3-2		1	
13.6-1	1		
14.2-1	1		
14.2.7-1			1
14.2.7-2	1		
14.2.7-3		1	
14.2.10-1	1		
14.2.10-2	1		
14.2.10-3	1		
14.2.10-4	1		
14.3.2-1	1		
14.3.2-2			1
14.3.2-3			1
14.3.2-4			1
14.3.2-5	1		
14.3.2-6	1		
14.3.2-7	1		
14.3.2-8	1		
14.3.2-9			1
14.3.2-10	1		
14.3.2-11			1
14.3.2-12	1		
14.3.2-13		1	
14.3.2-14			1
14.3.2-15	1		
14.3.3-1		1	
14.3.3-2		1	
14.3.3-3		1	
14.3.3-4		1	
14.3.3-5		1	
14.3.3-6		1	
14.3.3-7			1

OI No.	Open	Confirm	Resolve
14.3.3-8		1	
14.3.3-9		1	
14.3.3-10		1	
14.3.3-11			1
14.3.3-12			1
14.3.3-13			1
14.3.3-14			1
14.3.3-15			1
14.3.3-16			1
14.3.3-17			1
14.3.3-18			1
14.3.3-19	1		
14.3.4-1	1		
15.1.5-1			1
15.2.7-1	1		
15.3-1	1		
15.3-2	1		
15.3.6-1	1		
15.3.7-1			1
16.2-1			1
16.2-2	1		
16.2-3			1
17.3.2-1	1		
17.3.2-2	1		
17.3.2-3	1		
17.3.2-4			1
17.5-1	1		
18.3.3.1-1		1	
18.11.3.4-1		1	
18.11.3.5-1	1		
18.11.3.5-2		1	
18.11.3.5-3		1	
18.11.3.5-4		1	
18.11.3.6-1		1	
19.1.3.2-1			1
19.1.3.2-2	1		
19.1.10.1-1			1
19.1.10.1-2	1		
19.1.10.1-3	1		
19.1.10.1-4	1		
19.1.10.1-5	1		
19.1.10.1-6			1
19.1.10.2-1	1		
19.1.10.2-2		1	
19.1.10.2-3		1	
19.1.10.2-4		1	
19.1.10.2-5		1	
19.1.10.2-6	1		
19.1.10.3-1		1	
19.1.10.3-2		1	
19.2.3.3-1	1		
19.2.6-1			1
19.2.6-2			1
19.2.6-3			1
19.3.3-1			1
19.3.7-1		1	
19.3.10-1		1	
19.4-1	1		
19A.2-1			1
19A.2-2			1
19A.2-3			1
19A.2-4		1	
19A.2-5		1	
19A.2-6			1
19A.2-7		1	
19A.2-8	1		
19A.2-9		1	
19A.3-1			1
19A.3-2			1
19A.3-3			1
20.7-1	1		
20.7-2		1	
21.1-1	1		
21.5-1	1		
21.5-2	1		
21.5-3	1		
	62	**50**	**62**

AP 1000

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