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DCP/NRC0571  
Docket No.: STN-52-003

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

ATTENTION: T. R. QUAY

SUBJECT: INSERVICE TESTING OPEN ITEMS

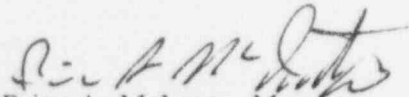
Dear Mr. Quay:

The attachment addresses a number of NRC open items, staff follow-on questions and questions identified during review meetings with the staff, for inservice testing. With the changes to subsection 3.9.6 and Table 3.9-16 included in Revision 4 and 8 of the AP600 SSAR the items are considered closed. A short response is provided to outline the justification for closure. The information provided should be sufficient for the staff and consultants to finish the review of inservice testing, resolve open items, and prepare the FSER input.

Items that had previously been given the NRC status of Closed, Resolved, or Action N are not included. These items were previously discussed in a meeting March 15 and 16, 1996 and a telephone call in September 1996.

In some cases valves that were previously included on the table and were subject of questions have been deleted as a result of design changes.

Please contact D. A. Lindgren at (412) 374-4856 if you have any questions.

  
Brian A. McIntyre, Manager  
Advanced Plant Safety and Licensing

/nja

Attachment

cc: Diane T. Jackson, NRC  
Nicholas J. Liparulo, Westinghouse (w/o attachments)

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## ATTACHMENT TO NSD-NRC-96-4791

### DSER Open Items

- Item 3.9.6.2-4 Westinghouse should revise the applicable SSAR sections and the IST program to comply with the staff positions in Section 3.9.6.2 of this report on the testing requirements for check valves.
- Response Closed - The description of check valve testing method included in Subsection 3.9.6.2.2 of the SSAR has been revised to be in conformance with the staff position. The check valve exercise test for check valves with safety-related missions to transfer open and/or to transfer closed shows that the valve opens in response to flow and closes when the flow is stopped. Reference to alternate means of remote indication inspection in SSAR Section 3.9.6.2.2 has been defited.
- Item 3.9.6.2-5 Westinghouse should revise the applicable SSAR section to comply with the staff's position as stated in SECY-90-016.
- Response Closed - A Combined License applicant information item on nonintrusive valve testing was included in subsection 3.9.8. The test program does not rely on periodic valve disassembly or inspection to detect degradation.
- Item 3.9.6.2-6 Westinghouse should revise the applicable SSAR section to comply with the Code. (OM Part 10, all fail-safe valves including those that rely on safety-related systems for actuation power to be fail safe tested.)
- Response Closed - SSAR subsection 3.9.6.2.2 includes the position that turning the valve off as in an exercise test is sufficient as a fail safe test.
- Item 3.9.6.2-7 Westinghouse should provide additional information on how a flow test satisfies the requirements of OM Part 10 Section 4.2.2, "Valve Seat Leakage Test".
- Response Closed - The statement that a flow test satisfies the requirements for valve seat leakage has been removed from subsection 3.9.6.
- Item 3.9.6.2-8 Westinghouse should provide in the SSAR a list of all pressure isolation valves if the Technical Specifications do not require a list.
- Response Closed - The list of pressure isolation valves in technical specifications are typically a subset of RCS pressure boundary that have some risk significance for intersystem LOCA. Because of the design of the normal residual heat removal system in the AP600, intersystem LOCA through leaking valves is not a risk significant issue. Sufficient integrity of RCS Pressure boundary valves is demonstrated by the IST program. A specific pressure isolation test is not required as part of the inservice test plan. Therefore, a list of the pressure isolation valves is not needed and has been removed from the AP600 Technical Specifications in Rev. 9 of the SSAR.

Item 3.9.6.3-1 Westinghouse should provide the bases for deferring valve testing to cold shutdowns or refueling outages.

Response Closed - SSAR Table 3.6-16 provides justification for deferral to shutdown for reasons of impracticability.

Item 3.9.6.4-2 Specific positions on the IST requirements for the identified components will be determined as a part of the staff's review of Westinghouse's implementation of the RTNSS process.

Response Closed - Subsection 3.9.6.1 includes the commitment that for pumps with RTNSS important missions there is the ability to measure flow rate, differential pressure, and pump vibration. Subsection 3.9.6.2 includes the commitment that for valves with RTNSS, important missions there is the ability to confirm their availability during operation.

#### Follow-on Questions

210.156 In the response to Q210.26, Westinghouse states that the IST program submitted in October 1993, will identify the areas and reasons where relief is appropriate. However, Section 3.9.6.2 of the IST program submitted in June 1994, states that "relief from the requirements for testing, if required, and the alternative to the tests are justified and documented as part of the test program development" and does not include any relief requests. Westinghouse should confirm that relief from the requirements of the 1989 Edition of the Code is not required.

Response Closed - Relief is requested in the SSAR subsection 3.9.6.3.1 to reduce the testing frequency to every six months for the ADS valves. The request indicates that the AP600 PRA, using the six month test frequency, meets its safety goals and that the results are not overly dependent on the ADS stage 1/2/3 valves.

210.158 Section 3.9.6.2.2 of the IST program states that fail-safe valves which rely upon non-safety-related systems to provide actuation power are subject to an inservice test. The Code requires all fail-safe valves, including those that rely upon safety-related systems to provide actuation power, to be fail-safe tested (Part 10, §4.2.1.6). The IST program should be revised to comply with the Code.

Response The SSAR has been revised to include fail safe tests consistent with the ASME Code.

210.164 The IST program includes containment isolation valves (CIVs), some pressure isolation valves (PIVs) (see Q210.166 below), and valves CVS-PL-V001 and 2, and RNS-PL-V003A and B as Category A valves. Westinghouse should verify that there are not other Category A valves (i.e., valves that have a specific maximum leakage requirement), such as temperature isolation valves (see NRC Information Notice No. 89-36: Excessive Temperatures in Emergency Core Cooling System Piping Located Outside Containment).

- Response Revision and review of the table has identified the AP600 inservice testing Category A valves. This review has confirmed that the AP600 has no temperature isolation valves.
- 210.166 Table 3.9.6-1 is missing the safety-related function and ASME valve category for a number of valves (i.e., PCS-PL-V002A and B, PXS-PL-V002A and B). Westinghouse should revise Table 3.9.6-1 to include this information.
- Response The table has been revised.
- 210.167 There are a number of safety-related pneumatically operated valves identified in Table 9.3.1-1 that are not included in the IST program (e.g., CVS-PL-V030A and B; PXS-PL-V003A, V130A and B, 230A and B, 232A and B, 306; RCS-PL-V110A and B, V241; SGS-PL-V086A and B). Further, valves PXS-PL-V003A and B could not be located on the piping and instrumentation diagram (P&ID). Additionally, the containment air filtration system valves are duplicated in Table 9.3.1-1. Westinghouse should revise the IST program, P&IDs, and Table 9.3.1-1, as applicable.
- Response The valves in Table 9.3.1-1 are included in Table 3.9-16. Both tables have been revised to reflect design changes.
- 210.169 Valves PCS-PL-V03, 5, and 23 provide the boundary between safety-related and non-safety-related piping. However, these valves are not included in the IST program. Westinghouse should review whether these valves have a safety-related function in the closed direction, and revise the IST program appropriately.
- Response PCS-PL-V05 and 23 have been added to the IST program (Table 3.9-16). Design changes for the AP600 has classified PCS-PL-V03 as a nonsafety-related valve and as a result is not included in the IST program.
- 210.170 Valves PCS-PL-V014A and B are shown as stop check valves on P&ID PCS M6 01, Revision 6. They are identified in the IST program as diaphragm/hand valves. The valve type and the associated testing should be revised. As check valves, Westinghouse should review whether they have a safety-related function in the closed, as well as open direction, and revise the IST program, as required.
- Response Valve PCS-PL-V014A has been changed to a manual valve. The valve body type has been removed from the table. PCS-PL-V014B is excluded from testing program because it does not have a safety-related function.
- 210.171 In the IST program, there is no exercise test required for valves PSS-PL-V008 and 9, although their safety-related function includes transferring closed. Westinghouse should revise the IST program to include this test.
- Response Valve PSS-PL-V008 has an exercise test identified. Valve PSS-PL-V009 does not have a safety-related function and is not included in the IST program.

- 210.176 Solenoid valves PXS-PL-V021A and B, V230, and V232 provide isolation to the non-safety-related piping and are fail closed valves. Additionally, check valves PXS-PL-V231A and B provide core makeup tank isolation and are considered critical valves (RAI 210.28). However, these valves are not included in the IST program. Westinghouse should revise the IST program.
- Response Valves PXS-PL-V021A and B supply nitrogen to the accumulators; valves PXS-PL-V230A and B and PXS-PL-V232A and B supply make up water to the core makeup and accumulators. These valves are normally closed and their safety-related functions is to remain closed. These valves are only opened for maintenance type functions, i.e., to provide tank makeup in case of leakage.
- 210.178 Valves PXS-PL-V028A and B, and 29A and B, provide reactor coolant system (RCS) pressure boundary isolation, but are not identified with a safety-related mission to close. Westinghouse should verify the function and mission of these valves, and revise the IST program accordingly.
- Response These valves do not have a safety-related mission to close; once accumulator injection starts, there is no need for these valves to re-close. Note that the check valve exercise test will test both opening and closing, see response to Item 3.9.6.2-4.
- 210.179 Valves PXS-PL-V119A and B, 120A and B, 122A and B, 123A and B, 124A and B, and 125A and B are active check valves that appear to have a safety function to transfer closed, and therefore should be exercised closed quarterly, if practicable. Additionally, Note 6 is indicated for these valves in Table 3.9.6-1 of the SSAR. This note states "Forward flow testing together with check valve position indication verifies RCS pressure boundary integrity." It is unclear how this is accomplished. Westinghouse should provide additional information and revise the IST program accordingly.
- Response Valves PXS-PL-V120A and B, 123A and B, and 125A and B have been changed to squib valves. Valves PXS-PL-V119 A and B, 122A and B, and 124A and B do not have a safety-related mission to close; once IRWST injection starts, there is no need for these valves to re-close. Note that the check valve exercise test specified will test both opening and closing, see response to Item 3.9.6.2-4. The note has been revised to delete reference to RCS pressure boundary integrity; refer to the response to Item 3.9.6.2-8 for additional information.
- 210.180 Valves PXS-PL-V016A and B, 17A and B, 28A and B, 29A and B, 122A and B, 123A and B, 124A and B, and 125A and B are identified in the technical specifications (TS), Revision 1, as pressure isolation valves. However, they are not included in the IST program as Category A valves, nor are they leak tested. Westinghouse should ensure that the IST program and TS are reconciled.
- Response The list of pressure isolation valves has been removed from the Technical Specifications. Refer to response to Item 3.9.6.2-8 for additional information.



- 210.182 Westinghouse has indicated that squib valves PXS-PL-V301A and B will be exercised and have their position indication verified every 10 years, and have their charge test fired at refuelings. OM Part 10, ¶4.4.1(c) requires at least 20 percent of charges be fired and replaced at least once every 2 years. The Code, ¶4.1, also requires that position indication verification be performed at least once every 2 years. Additionally, Note 5 of Table 3.9.6-1 of the SSAR states that the automatic depressurization system (ADS) valve test frequency will be determined based on a PSA. A relief request in accordance with the regulations, 10 CFR 50.55a, is required in order to use a test frequency based on risk. Westinghouse should comply with the Code and/or provide a relief request(s).
- Response Closed - SSAR section 3.9.6.2.2 and Table 3.9-6 were revised to change firing and replacing requirements for squib valve charges to a frequency of 20 percent every two years.
- 210.185 Valves RNS-PL-V022, 23, and SFS-PL-V-34, 35, 37, 38 are active valves that must transfer closed. However, the IST program does not require any exercise test. Westinghouse should revise the IST program accordingly.
- Response SSAR, Table 3.9.-16, includes quarterly full stroke testing of motor operated valves RNS-PL-V022 and V023 and quarterly full stroke testing of motor operated valves SFS-PL-V034, V035, and V038. Valve SFS-PL-V037 has a requirement for quarterly check valve exercise testing. Note that Table 3.9-16 will be updated to reflect this check valve test frequency. **ACTION W**
- 210.186 Check valves RNS-PL-V003A and B, 13, 15A and B, and 17A and B have a safety function in both the open and reverse flow directions. However, the IST program only specifies a forward flow exercise. The IST program should also include a reverse flow exercise. Westinghouse should revise the IST program accordingly.
- Response Valves RNS-PL-V003A and B, 13, 15A and B, and 17A and B have a requirement for a check exercise test. The check valve exercise test will test both opening and closing; see response to Item 3.9.6.2-4.
- 210.187 The IST program identifies two solenoid operated valves as the RCS head vent (i.e., RCS-PL-V152 and 153). However, P&ID RCS-M6-001, Revision 8, shows four head vent valves (i.e., V150 A through D). There is no fail-safe test specified for these fail closed valves. Additionally, the IST program identifies the safety valve discharge rupture disks as K001A and B. However, P&ID RCS-M6-002, Revision 8, identifies these as K03 and 4. These two documents should be reconciled.
- Response Closed - Table 3.9-16 identifies four head vent valves. As discussed in the response to 3.9.6.2-6, the fail safe test is incorporated into the exercise test. The requirements in lieu of inservice testing for nonreclosing pressure relief devices (rupture disks) are included in the last paragraph of SSAR subsection 3.9.6.2.2. Rupture disks are not included in Table 3.9-16 which is a table for valves.

210.200 Check valves PXS-PL-V016, 17, 28, 29, 119, 120, 122, 123, 124; and PCS-PL-V014A and B are required to be exercised open. As discussed in NRC GL 89-04, Position 1, in order to verify the valve's full-stroke to the open position, the maximum required accident flowrate is required to be passed through the valve. The P&IDs do not include any flow elements that could be used to measure this flowrate. Westinghouse should review the proposed test method for these valves and ensure that the valves will be full-stroke opened as discussed in the GL.

Response Valves PXS-PL-V120A and B and 123A and B have been changed to squib valves. Valves PCS-PL-V014A and B are not safety-related check valves. The other valves have a requirement for check exercise test. They will be exercised with sufficient flow to fully open the valves. That flow rate may be less than the maximum required accident flowrate.

### Meeting Open Items

In addition to the questions above, the four items were identified during the March 14 and 15, 1996 meeting on inservice testing. The following are the two items that have not previously been closed or resolved.

1. Westinghouse will review the fail-safe, fail-close function of the main steam isolation valves and revise the IST program, SSAR and P&IDs as necessary.

Response The steam generator steam isolation valves and their IST requirements have been reviewed. These valves are fail-closed except that the actuation solenoid valves are energized by 1E dc power during actuation. The actuation solenoids vent hydraulic pressure which allows high pressure nitrogen stored in the valve operator to close the valve. The proposed exercise tests (part stroke quarterly and full stroke during cold shutdowns) provide a demonstration of the fail-safe aspects of this valve.

3. Westinghouse will provide the staff with information on how the IST testing frequency for cold shutdown was incorporated into the probabilistic risk assessment.

Response The testing frequency is factored into the PRA calculations for failure probability of valves.