

February 23, 1998

Mr. Nicholas J. Liparulo, Manager
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SUBJECT: AP600 INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA
(ITAAC)

Dear Mr. Liparulo:

The enclosure to this letter contains requests for additional information or corrections to Revision 3 of the AP600 Tie information including the ITAAC. If you have any questions regarding this matter, you may phone me at (301) 415-3145.

Sincerely,

original signed by:

Jerry N. Wilson, Senior Policy Analyst
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Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No. 52-003

Enclosure: As stated

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Docket No. 52-003
AP600

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RAIs for AP600 ITAAC

- 640.176 The Tier 1 information for the passive containment cooling system (PCS) must include a design commitment and ITAAC for the coatings that will be applied to the internal and external surfaces of the containment vessel, including the surfaces of structures and equipment inside of containment, as necessary. The acceptance criteria for the PCS ITAAC must include the thickness of the coatings. Also, the PCS ITAAC must verify the important assumptions in the transport analysis for the failed coatings and other materials inside of containment and the transport analysis must be included in the AP600 SSAR.
- 640.177 Your response to RAI 480.1079 was acceptable but you must include the following design commitments in the ITAAC for the reactor cavity:
- a. No fibrous insulation shall be located within any spherical volume centered on the axis of a reactor coolant system pipe and with a radius of 12 times the inner diameter (ID) of that reactor coolant system pipe where any discharge from a break of that pipe would be intercepted by intervening components, supports and structures.
 - b. Where there are no intervening components, supports or structures, there shall be no fibrous insulation within a cylindrical volume extending out 45 IDs from the break along an axis that is a continuation of the pipe axis and up to 5 IDs in the radial direction from the axis.
- 640.178 In RAI 720.418F, the staff requested Westinghouse to confirm that core debris will not pass into the sump via interconnecting pipelines embedded in the concrete floor and/or sump curb. The RAI response, dated January 27, 1998, indicates that a number of sleeved drain holes will be embedded in the curb, but that these lines do not represent a pathway for core debris to enter the sump since the molten debris will quench and plug these lines. However, the RAI response also indicates that debris is expected to overflow the sump curb in the hinged failure mode scenario discussed in the submittal. In view of the sleeved drain holes in the curb and the potential for debris to overflow the sump curb in some scenarios, the following changes to PRA insights (PRA Chapter 59, Item 41) and ITAAC are needed: (1) the PRA insights and ITAAC should be modified to specify that there are no piping embedded in the concrete floor and/or sump curb that could provide a pathway for core debris to either enter the sump or pass from the sump to the containment boundary or the environment, and (2) the PRA insight regarding the design having "a sump curb of sufficient height and width to prevent molten core debris from overflowing or ablating through the curb" should be reconciled with the results of deterministic calculations provided in Appendix B of the PRA, which indicates that the debris can overflow the curb in some scenarios, and the revised insight should be incorporated into ITAAC.
- 640.179 Your response to RAI 640.174, which is related to RAI 640.152, on the AP600 Nuclear Fuel System and Control Rod Drive System is still unacceptable. These important systems should have their own ITAAC, consist with the approach taken by

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Westinghouse for its other systems, and not be included in the reactor vessel ITAAC (2.1.3). The ITAAC needs to have Tier 1 design descriptions that are consistent with the fuel and control rod ITAAC for the System 80+ design, because the AP600 design is not acceptable for any type of fuel or control rod design. Most of the design descriptions for the System 80+ Nuclear Fuel System and the Control Element Drive Mechanism are applicable to the AP600 design. Also, include figures for the AP600 fuel assembly and control rod drive mechanism that are similar to those provided for the System 80+ design.

- 640.180 In your response to RAI 440.742F, you committed to type testing of the pressurizer safety valves (refer to SSAR section 5.4.9). Verification of this test must be included in ITAAC. The ITAAC should specify the range of temperature and pressure for the type test and a minimum flow rate through the valves.
- 640.181 Your response to RAI 640.167F is unacceptable. The markup to Section 6.2.3.4.1 of the SSAR states that the containment isolation valves are verified to close within 20 seconds for the containment purge isolation valves and 60 seconds for all other containment isolation valves. This is inconsistent with Table 6.2.3-1 of the Revision 19 to the SSAR, which lists the containment closure times for the main steam line, main feedwater, and the containment air filter supply and exhaust as 5 seconds (refer also to SSAR chapters 9 and 15).

As stated previously, Westinghouse needs to implement a program that will verify that all Tier 1 information was extracted from the AP600 SSAR (Tier 2) and that all Tier 1 information is consistent with the information in Tier 2. An example of the problem is Tier 1 design commitment 11b of Table 2.3.2-4, which is not consistent with the containment isolation valve table in the SSAR (Table 6.2.3-1). Also, it is not clear, based on item 8 of Table 2.2.1-3, where the containment isolation valves of the CNS are identified.

- 640.182 Your response to RAI 640.159 is unacceptable. Your Tier 1 information for the initial Test Program omitted SSAR Section 14.2.3 information related to the conduct of the test program, i.e. the administrative requirements that govern the conduct of the test program, review, evaluation and approval of test results, and test records retention.
- 640.183 Your response to RAI 720.415 is unacceptable. The qualification of instrumentation and equipment required for severe accident mitigation and recovery to operate in the applicable environment must be verified by an ITAAC. The demonstration process used to provide reasonable assurance that the instrumentation and equipment will operate include one or more of the following factors: limited time period in or exposure to the environment, the use of similar equipment in commercial industry exposed to a similar environment, the use of analytical extrapolations, the use of vendor performance data, the use of procurement specifications imposed on the vendor, or the results of tests performed in the nuclear industry or at independent laboratories.
- 640.184 Your response to RAI 640.173 is unacceptable. The Tier 1 design description and ITAAC for SJS must have a commitment for the acceleration sensors to have a dynamic range of 0.001g to 1.0g and a frequency range of 0.20 Hz to 50 Hz. These commitments are consistent with the AP600 SSAR Section 3.7.4.2.1 and regulatory position 4.7 in Regulatory Guide 1.12. In addition, SSAR Section 3.7.5.4 is incorrect and should be deleted (refer to Chapter 2, Revision 17).