Westinghouse Electric Corporation Energy Systems

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DCP/NRC1181
NSD-NRC-97-5480
Docket No.: 52-003

December 11, 1997

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

ATTENTION: T. R. QUAY

SUBJECT: RESPONSE TO STAFF REQUESTS REGARDING THE AP600 INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA (ITAAC) - REACTOR SYSTEM

Dear Mr. Quay:

Enclosed is the Westinghouse responsesto an RAI related to comments on reactor internals testing in Revision 3 of the AP600 Certified Design Material as requested in a letter from the staff dated October 3, 1997.

With this transmittal the Westinghouse status for RAI o40.136 (OITS 6002) will be changed to "Confirm W" pending incorporation in an ITAAC revision. The NRC should review this response and inform Westinghouse of the status of the open item to be designated in the "NRC Status" column of the OITS.

Please contact Mr. Eugene J. Piplica at (412) 374-5310 if you have any questions concerning this transmittal.

C L Haag for BAM

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

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jml

Enclosure

cc: J. M. Sebrosky, NRC (w/Enclosure)
J. N. Wilson, NRC (w/Enclosure)
N. J. Liparulo, Westinghouse (w/o Enclosure)

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Question 640.136

REACTOR SYSTEM

In Table 2.1.3-3, add an ITAAC to verify the structural integrity of reactor internals of both prototype and non-prototype AP600 plants. The following information should be added:

Design Commitment

"The reactor pressure vessel (RPV) internals withstand the effects of flow-induced vibration."

Inspection, Tests, Analyses

"(a) A vibration type test will be conducted on the AP600 prototype plant RPV internals."

"(b) A flow test and post-test inspection will be conducted on the as-built RPV internals of all non-prototype AP600 plants."

Acceptance Criteria

"(a) A vibration type test report exists and concludes that the AP600 prototype RPV internals have no damage or loose parts as a result of the vibration type test."

"(b) A report exists which documents that the testing and inspection results of the non-prototype AP600 plants demonstrate that the as-built RPV internals have no damage or loose parts."

Response:

A Design Commitment and corresponding ITAAC have been added to the Reactor System to verify the structural integrity of the AP600 reactor internals. The test required for the first (prototype) AP600 reactor internals are not included. This test are not appropriate for inclusion in the ITAACs.

SSAR Revision:

None

ITAAC Revision:

See attached changes to CDM Section 2.1.3

2.1.3 Reactor System

Design Description

The reactor system (RXS) provides a barrier that prevents the release of fission products to the atmosphere.

1. The RXS components are identified in Table 2.1.3-1.

2. The components identified in Table 2.1.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

3. Pressure boundary welds in components identified in Table 2.1.3-1 as ASME Code Section III meet ASME Code Section III requirements.

4. The components identified in Table 2.1.3-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

5. The seismic Category I equipment identified in Table 2.1.3-1 can withstand seismic design basis loads without loss of safety function.

6. The reactor internals will withstand the effects of flow induced vibration.

7. The RXS limits the blowdown of the Reactor Coolant System (RCS) following the break of a direct vessel injection line.

~~6~~8. a) The Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

b) The Class 1E components identified in Table 2.1.3-1 are powered from their respective Class 1E division.

c) Separation is provided between RXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

9. The RPV is equipped with holders for at least eight capsules for storing material surveillance specimens.

~~7~~10. The ~~reactor vessel (RV)~~***RPV*** beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.

~~8~~11. Safety-related displays of the parameters identified in Table 2.1.3-1 can be retrieved in the main control room (MCR).

Table 2.1.3-3 is modified as follows (includes modifications as a result of responses to RAI 640.111 and RAI 640.112):

Table 2.1.3-3 (cont.)
Inspections, Tests, Analysis, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
6.) The reactor internals will withstand the effects of flow induced vibration.	*A pre-test inspection, a flow test and a post-test inspection will be conducted on the reactor internals.*	*A report exists and concludes that the as-built reactor internals have no observable damage or loose parts as a result of the flow test.*
7.) The RXS limits the blowdown of the RCS following the break of a direct vessel injection line.	*An inspection will be conducted to verify the flow area of the flow limiting venturi within each direct vessel injection nozzle.*	*The throat area of the direct vessel injection line nozzle flow limiting venturi is less than or equal to 12.57 in^2.*
68a) The Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analysis, or a combination of type tests and analysis will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.1.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
68b) The Class 1E components identified in Table 2.1.3-1 are powered from their respective Class 1E division.	Testing will be performed by providing simulated test signals in each Class 1E division.	A simulated test signal exists for Class 1E equipment identified in Table 2.1.3-1 when the assigned Class 1E division is provided the test signal.
68.c) Separation is provided between RXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.	See Certified Design Material, Section 3.3, Nuclear Island Buildings.

Table 2.1.3-3 (cont.)
Inspections, Tests, Analysis, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
9. The RPV is equipped with holders for at least eight capsules for storing material surveillance specimens.	*Inspection of the RPV for the presence of capsules will be performed.*	*At least eight capsules are in the RPV.*
710. The RPV beltline material has a Charpy upper-shelf energy of no less than 75 ft-lb.	Testing of the Charpy V-Notch specimen of the RPV beltline material will be performed.	A report exists and concludes that the initial RPV beltline Charpy upper-shelf energy is no less than 75 ft-lb.
811. Safety-related displays of the parameters identified in Table 2.1.3-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.1.3-1 can be retrieved in the MCR.