

July 27, 1992

Docket No. 52-001

Mr. Patrick W. Marriott, Manager
Licensing & Consulting Services
GE Nuclear Energy
175 Curtner Avenue
San Jose, California 95125

Dear Mr. Marriott:

SUBJECT: CONFIRMATORY AND OPEN ITEMS IDENTIFIED IN THE FINAL SAFETY EVALUATION REPORT (FSER) FOR CHAPTER 10, STEAM POWER CONVERSION, OF THE ADVANCED BOILING WATER REACTOR (ABWR)

The staff is developing the FSER for Chapters 10, of the GE Nuclear Energy (GE) ABWR Standard Analysis Report (SSAR). We have identified 2 preliminary confirmatory items where the staff and GE have reached tentative agreement. We also identified 8 preliminary open items where the staff and GE have not reached consensus. For each item, an amendment to the SSAR or revised inspections, tests, analyses and acceptance criteria, or additional information is required for complete closure.

Enclosed for your information is a summary of these confirmatory and open items.

Please contact me at (301) 504-1125 if you need additional information on these issues.

Sincerely,
Original Signed By:

Son Q. Ninh, Project Engineer
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

Enclosure:
As stated

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Mr. Patrick W. Marriott
General Electric Company

Docket No. 52-001

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10.2 Turbine Generator

ITAAC: GE has submitted the Turbine Generator Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for staff review. The results of this review will be provided in a supplement to this report. This is an open item.

10.3 Main Steam Supply System

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Main Steam Supply System and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. list all loads served by the system.
2. identify the MSIVs' ability to close against maximum differential pressure and flow conditions.
3. identify the seismic interface restraint on the drawing.
4. identify the seismic category and quality group for the system (including the nitrogen accumulators for the MSIVs and Main Steam safety/relief valves).
5. identify the building in which equipment is located.
6. identify all major instrumentation.
7. include requirement for the shutoff valves to close within 2 seconds.

Until this information is added, the staff cannot conclude that the Main Steam Supply System ITAAC assures that the system will be built in accordance with the certified design. This is an open item.

10.4.2 Main Condenser Evacuation System

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Main Condenser Evacuation System (MCES) and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. identify building in which equipment is located.
2. identify system's seismic category and quality group.
 - identify major instrumentation (hydrogen, flow, and pressure)
 - identify hydrogen analyzers
3. include the fact that system keeps hydrogen in the dilution stream below 4 percent by volume.
6. include the fact that the mechanical vacuum pump trips on a high main steamline radiation signal.
7. identify that the exhaust is monitored by the Turbine Building Compartment Exhaust system for radiation before discharge out the plant stack.

Until this information is added, the staff cannot conclude that the Main Condenser Evacuation System ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.

10.4.3 Turbine Gland Sealing System

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Turbine Gland Sealing Steam (TGSS) and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. provide a system drawing.
2. include the blower exhaust radiation monitor on the drawing.
3. identify all sources of steam to the system.
4. identify the TGSS condenser's source of cooling water.
5. clarify how the steam source is transferred on a high radiation signal. Is the transfer done manually or automatically?
6. identify building in which equipment is located.
7. include the fact that sealing steam is also provided to the turbine stop and control valves and the combined intermediate valves.
8. ensure ability to inspect and test the system.

Until this information is added, the staff cannot conclude that the Turbine Gland Sealing Steam ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.

10.4 Other Features

10.4.1 Main Condenser

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Main Condenser and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. include the seismic category
2. include a drawing of the condenser which shows all connections from various systems and major instruments.
3. add information to the design description stating that the system collects condensate flows, removes air and noncondensables, and removes hydrogen and oxygen.
4. identify building where condenser is located.
5. ensure condenser can be inspected and tested.
6. include the 4 minute condensate retention time.
7. state that on a condensate failure, the maximum flood level is less than grade.
8. provide measures to prevent direct impingement of bypass steam on the condenser tubes.

Until this information is added, the staff cannot conclude that the Main Condenser ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.

10.4.4 Turbine Bypass System

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Turbine Bypass System (TBS) and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. include the fact that the system can accommodate a full load rejection without lifting the main steam safety/relief valves.
2. include drawing.
3. include major instrumentation on the drawing.
4. identify signals which close the valves (loss of vacuum, loss of power, and loss of hydraulic pressure).
5. identify that the valves open when steam pressure exceeds a preset pressure limit.
6. ensure ability to inspect and test system.
7. ensure that all high-energy lines associated with the system are in the Turbine Building.

Until this information is added, the staff cannot conclude that the Turbine Bypass System ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.

10.4.5 Circulating Water System

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Circulating Water System (CWS) and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. identify that the system dumps heat to the power cycle heat sink.
2. indicate that the isolation logic scheme minimizes the potential for spurious high level isolation trips.
3. identify seismic category.
4. identify building in which equipment will be located.
5. indicate that the system will have features to prevent organic fouling.
6. indicate that the system will perform its function assuming a low level in the power cycle heat sink.
7. ensure ability to inspect and test the system.
8. indicate that one pump can be isolated for maintenance while the remaining pumps are operating.
9. indicate that features are provided to maintain a minimum circulating water temperature.
10. include major instrumentation on the drawing.

Until this information is added, the staff cannot conclude that the Circulating Water System ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.

10.4.6 Condensate Cleanup System

GE responded to this item in its letter of March 11, 1992. GE revised SSAR Section 10.4.6.3 to state that condensate system corrosion products and impurities from condenser leakage also will be removed and that the condensate cleanup system will comply with EPRI NP-4947-SR. The NRC staff finds this response acceptable and; therefore, this open issue (GE Outstanding Issue 105, is resolved subject to the revision of the SSAR in an amendment to reflect the information noted above. This is a confirmatory item. The staff concludes that the design of the CCS and its supporting systems conforms to staff guidelines and is acceptable, subject to the receipt of the SSAR amendment.

• 10.4.7 Condensate and Feedwater System

In a meeting with the staff on May 5, 1992, GE stated that insights from the PRA (Chapter 19 of the SSAR) indicate that the ability to open the valve using non-safety grade on-site power to initiate feedwater flow reduces the risk. Additionally, the spring closing check valves are testable and provide positive means of isolation. GE has committed to providing additional information detailing the information discussed at the May 5 meeting. Therefore, the staff finds that subject to the review of the additional information, the use of non-safety grade power for the manual shutoff gate valve is acceptable. This is a confirmatory item.

ITAAC

The staff has reviewed the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Condensate and Feedwater System (CFS) and has found that the information currently in the ITAAC is acceptable. In addition, the following information should be added:

1. provide a drawing of the system.
2. identify all cooling loads (offgas, SJAE, gland steam).
3. identify seismic category and quality group.
4. identify seismic interface restraint on the drawing.
5. include non-Class 1E power supply for the remote shutoff valve.
6. include isolation provisions.
7. include major instrumentation on drawing.

Until this information is added, the staff cannot conclude that the Condensate and Feedwater System ITAAC assures that the unit will be built in accordance with the certified design. This is an open item.