

September 7, 1984
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United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing

References: (a) Construction Permits CPPR-135 and CPPR-136, Docket
Nos. 50-443 and 50-444
(b) USNRC Letter, dated May 7, 1984, "Request for Additional
Information on Environmental Qualification of Electrical
Equipment Important to Safety", G. W. Knighton to
R. J. Harrison
(c) PSNH Letter, SBN-549, dated August 12, 1983, "Response to
Safety Evaluation Report Outstanding Issue #6 (SER 3.11;
Equipment Qualification Branch)", J. DeVincentis to
G. W. Knighton

Subject: Response to Safety Evaluation Report Outstanding Issue #6
(SER 3.11; Equipment Qualification Branch) and Request for
Additional Information 270.4 Through 270.12

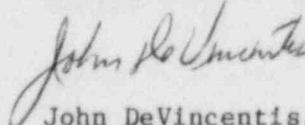
Dear Sir:

In response to your Request for Additional Information (RAI) included in
Reference (b), we have enclosed responses to RAI 270.4 through 270.12.

Section 3.11 of the FSAR and our report entitled "Environmental
Qualification of Electrical Equipment Important to Safety" (EQR) which was
submitted in Reference (b) will be revised as indicated in the enclosed RAI
responses.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY



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RAI RESPONSES

RAI 270.4 (3.11)

A single failure has apparently not been assumed when calculating the maximum pH for chemical spray qualification purposes. This is required by 10CFR50.49(e)(3).

Response:

The Seabrook containment spray system design provides a limited amount of NaOH available for ECCS injection and spray purposes. In the calculation of maximum spray pH for long-term cooling, the entire volume of caustic was assumed to be added to the sump water. Postulated single failures would not increase recirculation spray pH.

RAI 270.5 (3.11)

The difference between the incontainment temperature and pressure profiles published in the Equipment Qualification Report (Figure 3-1) and the profile published in the FSAR (Figure 3.11 (B)-1) should be explained, along with a detailed explanation of the methodology used to establish these curves beyond the 10^5 seconds curves published in the FSAR.

Response:

The differences between the incontainment profiles in the FSAR (Figure 3.11(B)-1) and the Environmental Qualification of Electrical Equipment Important to Safety Report (EQR) (Figure 3-1) is that these two figures reflect different revisions of the same UE&C document, namely Drawing No. 9763-F-300219. The document is being revised and will appear both in the FSAR and the EQR. These environmental envelopes incorporated the results obtained in the long-term containment temperature response analysis (Calc. Set No. 4.3.23-25F).

The method used to extend the curves on Drawing Number 9763-F-300219 (Figure 3-1 of the EQR) beyond 10^5 seconds was an extrapolation of the LOCA profiles back to steady-state conditions. This method is very conservative since it does not account for the precipitous drop in temperature and pressure that calculations have shown occurring at the initiation of hot leg injection.

These calculations show that with a switchover to hot leg injection at 18 hours, the containment temperature returns to 120°F more rapidly (approximately 4 days after LOCA) than that indicated by the pressure and temperature profiles shown on Drawing Number 9763-F-300219 curve. The calculations also demonstrate that with worst case heat loads and no spray the containment temperature can rise above 120°F and the intermittent use of the spray beyond the 30-day post-accident period will maintain the 120°F .

RAI 270.6 (3.11)

Section 4.1.4E is contradictory. The flood levels for the containment and the RHR, CS, and SI equipment vaults should be supplied. These levels should be compared to the equipment elevations, and a walkdown executed to ensure that these elevations are correct. Also, if credit is taken for floor drains, this system must be qualified.

Response:

Section 4.1.4E will be changed to more clearly state the intent of this paragraph, i.e., any Class 1E equipment needed to operate post-accident which could be submerged will be qualified for submergence. This does not include Class 1E equipment in the RHR, SI, or CS equipment vaults because of redundant equipment located in separate vaults. Only one of these redundant vaults could be flooded for any particular break, consequently the loss of equipment in any one vault due to submergence would not effect accident mitigation.

The flood level of the containment is $(-)20' - 8"$ and any Class 1E equipment in the containment which is needed to operate post-accident will have a walkdown executed to confirm its elevation.

No credit is taken for floor drains.

RAI 270.7 (3.11)

It is unclear if the seals mentioned in Section 4.1.6 are qualified. Also to be considered are cable splices and other electrical interface equipment.

Response:

The seals mentioned in 4.1.6 are qualified and the next revision of the EQR will clarify this. Also to be addressed in this revision will be the qualification of cable splices and other electrical interface equipment. Qualification documentation and evaluations of all electrical interface equipment will be provided as part of the EQ package.

RAI 270.8 (3.11)

Define "appropriate margins" as used in the context of Section 4.1.5 of the Environmental Qualification (EQ) report.

Response:

By "Appropriate Margins" in Section 4.1.5, it is meant that the recommended margins stated in IEEE Std. 323-1974 are met. If these requirements in any particular case are not met, then the application of that device and its particular location are analyzed and a justification is written.

RAI 270.9

The Qualification Evaluation Worksheets (QEW) are incomplete. Missing are notations to explain:

- a. Outstanding items
- b. Qualified life
- c. Maintenance and surveillance requirements
- d. Qualification methods
- e. Qualification environment does not always envelope accident environment.

In addition, some equipment listings in the BOP section of Appendix A have no QEW and no corresponding listing in Appendix 3H of the FSAR. There are also some new QEW sheets with no equipment listings.

Response:

The Seabrook Program documents equipment qualification in a file or package format. Within this format, the Assessment Report [Environmental Qualification Report (EQR), Section 4.2.2] provides a review of vendor documentation. The QEW is part of the Assessment Report and is provided in the EQR to supplement other information contained therein.

Concerning the specific items noted by the NRC as missing from the QEW, these are provided within the Seabrook EQ Program as follows:

a. Outstanding Items

The qualification status, including the identification of outstanding items is found for each Purchase Order and equipment type as part of the Index at the front of Appendix B of the EQR.

b. Qualified Life

The Qualified Life is on the Qualification Evaluation Worksheet (QEW) under the "Qualified" column. Changes will be made in the next version of the EQR to clarify the format for qualified life data in this column.

c. Maintenance and Surveillance Requirements

This information is specifically found in each Assessment Report (see EQR, Figure 4.4, Page 3).

d. Qualification Methods

The method of qualification is fully described in the test report included with the vendor documentation package.

e. Qualification Environment Does Not Always Envelope Accident Environment

Figure 1 of the Assessment Report details a comparison of test and postulated accident profiles. Any exceptions and justification for acceptability are provided in the Assessment Report.

The FSAR is presently being revised to delete Appendix 3H and in its place, a reference is made to the Equipment List in the EQR. Appendix 3H is an early revision of the Class 1E equipment located in "harsh" and "mild" environments. Appendix A of the EQR listed only Class 1E equipment in a "harsh" environment.

The EQR will be revised to eliminate any discrepancies between the Equipment List in Appendix A and the QEW sheets in Appendix B.

RAI 270.10 (3.11)

No qualification evaluation worksheets have been prepared for the NSSS scope of supply. Therefore, it is not possible to determine from available data:

- a. The applicable reference being used to establish qualification.
- b. The qualification status of each equipment item.
- c. The items mentioned in Statement 6.

Response:

QEW sheets for the NSSS scope have been initiated but are not complete at this time. Items a and c will be addressed in the applicable QEWs. Item b will be added to the EQR similar to the status information now listed for BOP equipment at the beginning of Appendix B.

RAI 270.11

Verify that the Seabrook EQ Program includes all equipment in Categories 1 and 2 of Regulatory Guide 1.97, Revision 2, which is currently installed or that will be installed prior to fuel load. Justification must be provided for all Category 1 and 2 items that are not included in the EQ program.

Response:

We are in the process of selecting our accident monitoring instrumentation following the guidance in Regulatory Guide 1.97, Revision 3. Any exceptions to the recommendations of the Regulatory Guide will be indicated and justified.

Our EQ program will include those items that we list as Category 1 and 2 items.

RAI 270.12 (3.11)

A review of the Seabrook Station FSAR Section 3.11 indicated the following areas of concern.

- a. There is a lack of correlation between some values in Tables 3.11(N)-2 and 3.11(N)-3 and those found in the Service Environment Chart [Figure 3.11(B)-1].
- b. The normal dose for one area in Note 9 of the Service Environment Chart is still listed as "Later".
- c. Appendix 3H does not contain all the qualification information indicated in Section 3.11(B).1.
- d. The summary provided in Section 3.11(B).2 is incomplete. Is the EQ report a supplement to the summary or a replacement for the summary? Please clarify.

Response:

- a. These discrepancies will be reviewed and appropriate revisions made to the FSAR.
- b. The final dose calculations for this area have been completed and will be included in the next revision of the Service Environment Chart.
- c. The FSAR is presently being revised and Appendix 3H is being deleted. In its place, a reference will be made to the Environmental Qualification of Electrical Equipment Important to Safety Report (EQR). All Equipment Qualification Information referred to in Section 3.11(B)-1 of the FSAR, will be included in the EQR, Assessment Reports, and/or vendor documentation.

d. Section 3.11(B).2 is presently being revised. Changes which are pertinent to this RAI are summarized as follows:

1. Section 3.11(B).2.1 - the present summary is being deleted and replaced by a reference to the EQR report. The summary sheets in Figure 3.11(B)-2 are also being deleted. The EQR discusses the equipment qualification methodology in greater detail.
2. Section 3.11(B).2.2 - the present summary is to be deleted and replaced by a summary that expands on conformance to general design criteria of Appendix A and B to 10CFR50 and conformance to specific IEEE standards.

In the sections of the FSAR where the EQR is referenced, the EQR is a replacement for the FSAR summary.