

NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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May 15, 1984

Docket No. 50-423
B11179

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

- Reference: (1) B. J. Youngblood to W. G. Counsil, Draft SER for Millstone Nuclear Power Station, Unit 3, dated December 20, 1983.
- (2) W. G. Counsil to B. J. Youngblood, Meeting Summary of NRC Structural Audit, dated March 23, 1984.

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit 3
NRC Structural and Geotechnical
Engineering Branch (SGEB)
Review Meeting, May 9, 1984

A meeting was held between the NRC-SGEB and Northeast Nuclear Energy Company (NNECO) in Bethesda, Maryland on May 9, 1984 to discuss the status of all remaining structural open and confirmatory items as identified in References (1) and (2). Attachment I is a list of the attendees.

Attachment II provides the status of the SGEB Draft SER Open Items, Structural Audit Items and the 220 series review questions. Attachment III provides a description of the additional information that NNECO has committed to provide as discussed at the meeting. Attachment IV provides NNECO's response to Structural Audit Item 35 thus making this a confirmatory item. A meeting is tentatively planned for the first week in June, the next date the SGEB reviewer will be available, to discuss the staff's concerns on several of the confirmatory items, including Stone & Webster's topical report on tornado missiles.

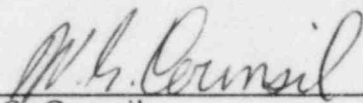
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If you have any concerns related to the information contained herein please contact our licensing representative, Ms. C. J. Shaffer, at (203) 665-3285.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY et al
By Northeast Nuclear Energy Company,
Their Agent



W. G. Council
Senior Vice President

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Council, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.



Notary Public
My Commission Expires March 31, 1988

cc: Ms. E. L. Doolittle -- NRC Project Manager
Mr. Niles Chokshi -- NRC - SGEB
Mr. David Jeng -- NRC - SGEB

ATTACHMENT I

ATTENDANCE

NRC Structural Review Meeting, May 9, 1984

<u>Name</u>	<u>Organization</u>
David Jeng	NRC/SGEB, Section Leader
Nilesh Chokshi	NRC/SGEB
W. R. Rotherforth	NUSCO/GCE
W. J. Briggs	NUSCO/GCE
R. J. Skwirz	NUSCO/GCE
C. J. Shaffer	NUSCO/GFL

ATTACHMENT II

MILLSTONE NUCLEAR POWER STATION, UNIT 3
SGEB REVIEW MEETING, MAY 9, 1984

STATUS OF DRAFT SER OPEN ITEMS,
STRUCTURAL AUDIT ITEMS,
AND 220 SERIES REVIEW QUESTIONS

MNPS-3

STATUS OF DRAFT SER OPEN ITEMS

<u>Item No.</u>	<u>Description</u>	<u>Status (Submittal Date)</u>
SGEB-01	Barrier Design Procedures (3.5.3)	Confirmatory (3/23/84)
SGEB-02	Seismic Input (3.7.1)	Closed (3/23/84)
SGEB-03	Seismic System Analysis (3.7.3)	Closed (3/23/84)
SGEB-04	Seismic Instrumentation Program (3.7.4)	Closed (5/4/84)
SGEB-05	Concrete Containment (3.8.1)	Closed (5/4/84)
SGEB-06	Concrete & Structural Steel Internals (3.8.3)	Closed (5/4/84)
SGEB-07	Other Cat. I Structures (3.8.4)	Closed (5/4/84)
SGEB-09	Foundations (3.8.5)	Closed (5/4/84)
SGEB-10	Dynamic Loading - Foundation Stability (2.5.4.3)	Closed (3/23/84)
SGEB-12	5% Critical Damping - Bolted Steel Stuct. (3.7.1)	Closed (3/23/84)

Millstone Nuclear Power Station Unit No. 3

STATUS OF STRUCTURAL AUDIT OPEN AND
CONFIRMATORY ITEMS

<u>Question No.</u>	<u>Description</u>	<u>Status</u>
Item 1	An example of seismic design of discharge tunnel should be provided for review. The example was reviewed and the item resolved.	Closed (3/23/84)
Item 2	Justify the use of 5 percent damping for bolted steel structures instead of 4 percent when subject to OBE loading. For bolted steel structures compare the actual stress level to the associated stress limits in the FSAR damping table.	Closed (3/23/84)
Item 3	SEB-09, 10 and 11 refer to differences between codes used in plant design and staff acceptance criteria. Demonstrate that, the Applicant meets at least the intent of the SRP in these issues. (See attached questions)	Closed (5/4/84)
Item 4	Provide an example on how changes in loads are handled in design procedures. Two load change examples were reviewed to indicated this procedure and the issue was resolved.	Closed
Item 5	Discuss how artificial time history is generated using SIMQKE program.	Closed
Item 6	Provide an example of the results of composite model damping for review. One example of the main steam valve building was presented and the issue was resolved. The Applicant will provide this response.	Closed (3/23/84)
Item 7	Provide velocity and displacement time history profiles for the input ground motions to demonstrate that appropriate baseline correction was implemented.	Closed (3/23/84)
Item 8	Provide justification for not considering uncracked sections on containment internals in seismic analysis.	Closed (4/9/84)
Item 9	Provide comparison of development of torsional constants using computer program SECPROP versus classical shell theory for crane wall.	Closed (3/23/84)
Item 10	Consider the effect of embedment of Category 1 structures on the seismic response.	Closed (3/23/84)

<u>Question No.</u>	<u>Description</u>	<u>Status</u>
Item 11	How do the shear moduli obtained by artificial time history compare with shear moduli from real earthquakes. Shake results for the artificial time history were provided by F. Vetere and the issue was resolved. The Applicant will provide this response.	Closed (3/23/84)
Item 12	Show how the 2 degrees of freedom Plaxly soil element is transferred into a rotational input for the lumped mass structural model. Demonstrate how the control building was considered in the soil model. Provide description similar to EGE building for the control building showing soil structure interaction. Provide description on the modified halfspace analysis.	Closed (3/23/84)
Item 13	Indicate how the effect of the NSSS systems were accounted for in the seismic evaluation, of internal structures.	Closed (3/23/84)
Item 14	Provide a detailed discussion on how the CM and CR are considered in development of stiffness matrix.	Closed (4/9/84)
Item 15	<p>With respect to ultimate capacity of containment</p> <ul style="list-style-type: none"> o Were elements that yielded prior to final yielding, continuously checked to insure that they were within acceptable ductility limits? o Provide justification to indicate why the calculated ultimate pressure is the median of the probability distribution. o Review the basis shell/mat junction and demonstrate that compressive failure modes were adequately considered. <p>Item resolved pending the review of report and additional information.</p>	Confirmatory (4/9/84)
Item 16	Provide examples on how the 3 components of the earthquake are combined to comply with Regulatory Guide 1.92.	Closed (3/23/84)
Item 17	Provide justification as to why vertical flexibility of floor slabs is not considered in generation of floor response spectra.	Confirmatory

<u>Question No.</u>	<u>Description</u>	<u>Status</u>
Item 18	How does the applicant obtain subgrade modules (k) for the rock in the design of containment mat. Explanation was provided and considered to be resolved.	Closed
Item 19	Provide a comparison of results in internal structure from Finite Element analysis and STRUDL Resolved. Lakshmi will provide sketches and documentation.	Closed (3/23/84)
Item 20	Perform simplified assessment of basemat design to demonstrate that equations 7 and 9 from FSAR Page 3.8-13 do not govern. In case of some exceedance in allowable stresses for the two conditions, the as-built material strength can be used to show that at least the intent is met.	Closed (3/23/84)
Item 21	Provide actual re-bar calculations for the base mat.	Closed.
Item 22	Show how the wall tangential shear and over-turning moment is handled.	Closed
Item 23	Provide design follow-up including load definitions through re-bar quantity determination of steam generator cubicle barrier wall (central radial wall). Also consider the three component combination aspects in the earthquake analysis.	Closed (3/23/84)
Item 24	Copy from microfilm the results from STRUDL analysis for element 341. (Equipment hatch)	Closed
Item 25	Provide a verification example for RIG No. 4 computer program.	Closed (4/9/84)
Item 26	With respect to the EGE Seismic Analysis, please assess the effect of combining 2 directional response versus that of the 3 component combination as required in the staff position.	Closed (3/23/84)
Item 27	Provide justification for generation of ARS based upon one component of input motion.	Closed (5/4/84)
Item 28	Method of Peak Broadening has to be reviewed. Method was reviewed creating another item (38) to remain open.	Closed
Item 29	Provide the Finite Element-Frame Analysis comparisons for the Spent Fuel Pool Analysis.	Closed (3/23/84)
Item 30	Provide design calculations of pipe support R7L.	Closed

<u>Question No.</u>	<u>Description</u>	<u>Status</u>
Item 31	Provide the technical basis for how the fluid sloshing effects are modeled in the fuel pool seismic analysis.	Closed
Item 32	Discuss how venting was considered for internal cubicle pressurization (Sec. FSAR 3.3.3). Item resolved if a sentence to reflect actual venting is included in FSAR, i.e., that all structures except for fuel building were designed for non-venting situation.	Confirmatory (3/23/84)
Item 33	Justification of unity DLF of pressure drop provided description and results as presented. Resolved.	Closed (3/23/84)
Item 34	Fuel building crane required for review, look at stress report shear checks, bolts.	Closed
Item 35	Demonstrate that the applicant complies with SRP 3.8.4, Appendix D in the design of fuel racks. Refer to NRC Question 220.6.	Confirmatory (5/15/84) (Response attached)
Item 36	Provide assessment of Cat. 1 tanks to include consideration of flexibility and demonstrate that the intent of NRC is met. For those tanks which are judged not to require assessment, provide basic reasons for not doing so.	Closed (5/4/84)
Item 37	Provide calculations on retaining wall designs. Resolved.	Closed
Item 38	Justify the peak broadening procedure in relation to Reg. Guide 1.122.	Confirmatory
Item 39	A review of accidental torsion SEB Item 08 should be performed. Reviewed and found acceptable. Resolved.	Confirmatory (3/23/84)
Item 40	Provide discussion of containment liner designs to show that the intent of ASME III Division 2 is met. This item will be included in Item 3.	Closed
Item 41	Questions 220.12, 13, and 15 deal with SWEC topical report on tornado missiles. This item will be resolved pending confirmation of this report.	Confirmatory
Item 42	Question 220.9 concerns the ability of structural steel frames to withstand tornado pressure prior to siding blowout.	Confirmatory (5/4/84)

<u>Question No.</u>	<u>Description</u>	<u>Status</u>
Item 43	Question 220.8 concerns the capability of foundations to transfer stress. Information was reviewed and found acceptable.	Closed

MILLSTONE NUCLEAR POWER STATION UNIT NO. 3

STATUS OF 220 SERIES QUESTIONS

<u>Questions</u>	<u>Status</u>
220.5	Closed
220.6	Closed
220.7	Closed
220.8	Closed
220.9 (Audit Item 42)	Closed
220.10	Closed
220.11	Closed
220.12, 13 & 15 (Audit Item 41)	Confirmatory
220.14	Confirmatory
220.16	Closed, GSB open item
220.17	Closed
220.18 (Audit Item 2)	Closed
220.19 (Audit Item 12)	Closed
220.20 (Audit Item 8)	Closed
220.21 (Audit Item 39)	Confirmatory
220.22	Closed
220.23	Closed
220.24	Closed
220.25	Closed
220.26-220.29 (Audit Item 3)	Closed
220.30	Closed
220.31	Closed
220.32 (Audit Item 3)	Closed
220.33-220.35	Closed
220.36-220.37 (Audit Item 3)	Closed
220.38	Closed

ATTACHMENT III

DISCUSSION OF ITEMS REQUIRING
ADDITIONAL INFORMATION

SGEB
MAY 9, 1983

- Item No. 3 Plant Design Code Comparison.
- NNECO will revise Attachment 3, page 2, Note 3 by adding statement to clarify that in general, load factor of 1.4 vs. 1.7 (Code) is not the governing case.
- Item No. 8 Cracked Section on Containment Internals.
- NNECO will respond to the following NRC concerns:
- o Why was only one cubicle considered cracked, and why only the cubicle?
- Item No. 9 Torsional Constants using SECPROP vs. Classical Shell Theory.
- NNECO will revise the response to clarify that the problem reviewed is specific for the containment shell and is not for rectangular structures.
- Item No. 15 Ultimate Capacity of Containment.
- Nilesh Chokshi is still reviewing our response and has some general concerns regarding the use of median vs. mean and the definition of failure. NNECO will meet with Mr. Chokshi to discuss his concerns regarding this item after he has completed his review, and informed us of specific concerns.
- Item No. 17 Vertical Floor Flexibility
- NNECO will submit data by the end of May.
- Item No. 19 Finite Element and STRUDL Comparison
- NNECO will add a conclusion to this response that the frame analysis is conservative and thus a satisfactory method of analysis to use.
- Item No. 27 3 Component A.R.S.
- NNECO will supply the spectra curves showing the comparison.
- Item No. 29 Spent Fuel Pool Analysis
- NNECO will revise the response to add a conclusion of the results of analysis.
- Item No. 32 Venting of Internal Cubicle Pressurization
- NNECO will clarify response as to assumption of venting.

- Item No. 33 Unity DLF of Pressure Drop.
- NNECO will provide the plot of the shape of the pressure pulse.
- Item No. 35 Design of Spent Fuel Racks
- NNECO will provide a response to NRC stating that Millstone 3 racks do comply with SRP 3.8.4 Appendix D, thus making this a confirmatory item. Westinghouse and NRC discussions are ongoing regarding NRC's generic position. (NNECO's response to this item is contained in Attachment IV).
- Item No. 36 Tank Water Flexibility
- NNECO will provide the calculations for the tank and foundation analysis.
- Item No. 38 Peak Broadening
- NNECO will justify the use of 10% broadening and include all curves in the response.
- Item No. 39 Accidental Torsion
- NNECO will clarify how the calculations were performed to come up with additional stress.
- Item No. 41 Tornado Missiles - SWECO Report
- SWEC will meet with NRC to discuss the report. NRC will provide a list of concerns to be addressed at the meeting. This is tentatively scheduled for the first week in June.
- Item No. 42 Tornado Pressure - siding blowout.
- NNECO will respond to the following NRC questions:
- o Show where there is exceedance of stresses against SRP allowables. Elaborate on local stress effects.
 - o What is the capacity of the fasteners?
 - o What was the total pressure assumed that the siding took?

ATTACHMENT IV

Millstone Nuclear Power Station, Unit No. 3

STRUCTURAL AUDIT OPEN ITEMS

ITEM 35 Demonstrate that the applicant complies with SRP 3.8.4, Appendix D in the design of fuel racks.

Response: A point by point comparison was made of the Millstone 3 Rack Design with the requirements of SRP 3.8.4 Appendix D and the 1980 Edition Winter 1982 Addenda of the ASME Code. Results show that the Millstone 3 racks comply with the acceptance criteria as stated.

Status (5/15/84): Confirmatory