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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 16 1979

Docket No: 50-341

Dr. Wayne H. Jens
Assistant Vice President
Engineering & Construction
The Detroit Edison Company
2000 Second Avenue
Detroit, Michigan 48226

Dear Dr. Jens:

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION IN FERMI 2 FSAR

As a result of our continuing review of the Final Safety Analysis Report (FSAR) for the Enrico Fermi Atomic Power Plant Unit 2, we have developed the enclosed requests for additional information.

Please amend your FSAR to comply with the requirements listed in the enclosure. Our review schedule is based on the assumption that the additional information will be available for our review by April 27, 1979. This is the latest date for filing information to be considered in our Safety Evaluation Report for Fermi 2. If you cannot meet this date, please inform us within 7 days after receipt of this letter so that we may revise our scheduling.

Sincerely,

John F. Stolz

John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management

Enclosure:
Requests for Additional
Information

cc:
See next page

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Dr. Wayne H. Jens

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ENCLOSURE

REQUESTS FOR ADDITIONAL INFORMATION

ENRICO FERMI ATOMIC POWER PLANT UNIT 2

DOCKET NO. 50-341

Requests by the following branches in NRC are included in this enclosure. Requests and pages are numbered sequentially with respect to previously transmitted requests.

Branch	Page No.
Materials Engineering - Metallurgy Section (This page supersedes Page 122-2 transmitted March 2, 1979)	122-2
Structural Engineering Branch	130-4 through 130-7

Revised March 9, 1979

122.0 MATERIALS ENGINEERING BRANCH - METALLURGY SECTION

122.2 Recent operating experience at BWR plants has indicated degraded performance of the design and materials in the safe ends and thermal sleeves of the recirculation nozzles of the reactor vessel. Provide a sketch of the design and the materials used in the Enrico Fermi Atomic Power Plant No. 2 for these areas. Provide an evaluation of the design that will give reasonable assurance that these items will not degrade in service.

122.3 Recent operating experience at BWR plants has indicated degraded performance of the design and materials in the collet retainer tube, index tube, and piston tubes of the control rod drive (CRD) mechanisms. Provide a sketch of the design, materials used and an inspection program for these items used in the Enrico Fermi No. 2 plant. Provide an evaluation of the design, materials and inspection program that will give reasonable assurance that these items will not degrade in service.

122.4 Provide a description of the implementation of NUREG-0313 (MTEB BTP-7), stainless steel cracking by IGSCC, including the isolation condenser lines and shut down heat exchanger lines. The response should include the materials of construction and the methods used for mitigating stress corrosion cracking in the referenced lines.

130.0 STRUCTURAL ENGINEERING BRANCH

130.5 Concerns on Report SL - 3647 on Sacrificial Shield Design

1. In Section II under item A it is stated that the buckling of the sacrificial shield plates is prevented by studs welded to the plates and embedded in the concrete. Indicate how the size of studs and spacing of the studs are determined.

2. In Section II under item C it is indicated that a special "Shear Lug" connection attaches the truss gusset plates to the containment vessel and permits radial movements but restrains tangential movement of the shield. Provide more details to show that the shear lug will function as designed.

3. In Section V you indicated that a finite element program, FORANL, a Fourier analysis of the time histories was used to obta- a single time history at different strips. Provide the single time history obtained by such an analysis, and indicate the time histories taken from NUS-3124 report to obtain the single time history.

4. In Section V, it is indicated that a thin shell of revolution program DYNX is used, for the analyses of the reactor pedestal which has a radius to wall thicknesses ratio of 3.18, and length to radius ratio of 2.08. Provide justification for using a thin shell of revolution program for such a thick and short shell.

5. As described in Appendix A of the report, DYNAX can perform three methods of analysis. Indicate which method you used in your present analysis.

6. In Section V, it is stated that the sacrificial shield is modeled as an orthotropic material. Indicate how the vertical steel columns to which the steel plates are welded and the filler concrete are modeled in the analysis, noting that the concrete is to transmit only shear forces between the exterior and the exterior plates and may be cracked. Provide a sketch of the element model with the orthotropic properties identified.

7. Provide sample calculations to show how the forces, moments and shears as shown in Tables 8 are used to calculate the stresses in the steel plates columns, welds and concrete as shown in table 9,10,11 and 12 for the sacrificial shield. Provide the same for the pedestal wall.

8. In load combination 1 shown in Tables 1 and 2, a load factor of 1.25 should be applied to both Ap and E_0. This requirement is contained in Document B and is applicable to the sacrificial shield and pedestal.

130.6 Concerns on Interim Structural Evaluation Report By Nutech On Mark I Containment

1. In Section 4.1 time dependent loads are shown in various figures. However there are no indications how these time dependent loads are established. If they are obtained from the reports published under the Mark I short term or long term term program, make reference to specific figure number and report number and have each figure in Section 4.1 so identified.

2. In Section 4.2 you based controlling events on the assignments developed in Reference 13. In December, 1978, General Electric issued NEDO-24583 Report entitled "Mark I Containment Program Structural Acceptance Criteria, Task 3.1.3, Plant Unique Analysis Application Guide". Indicate if the results of your evaluation will be different, should NEDO-24583 Report be used instead of Reference 13 as basis.

3. In Section 5.1, it is stated that STRUDL - II has the capability to perform the nonlinear analysis to determine the load - displacement relationship of geometrically nonlinear structures. Provide a succinct description of such a nonlinear analysis by STRUDL - II, if it is employed in the design and analysis FERMI II containment structures, and identify the structure or structures so analyzed.

4. In Section 5.2 STRUDL DYNAL computer program is described. Indicate how this program is validated.

5. According to GE Report No. NEDO-21888, in addition to pool swell, SRV discharge, and chugging, condensation oscillation should also be considered in the analysis of torus shell and its internal structures. However from what is presented in the report, it appears that condensation oscillation has not been considered. Provide your reason for not considering the effect of such a load.

6. In the load combinations considered in evaluating the columns, column tie plates and earthquakes as indicated on page 6.8, the term DLS is indicated to represent dead load of steel and live load of water plus seismic loads. Since the dead load of steel and live load of water are basically static load, provide an explanation how seismic loads which are dynamic loads can be considered with dead load and live load. It is noted that no specific seismic analysis is given in the report.

7. On page 6.12 in the paragraph following item 2, it is stated that in order for plane sectons to remain plane at the juncture of the beam element with the flat plate elements, additional beam elements with large section properties are used to join the boundary nodes of the flat plate elements. If these additional beam elements are provided only for mathematical convneience and are non-existant in the actual structure, how can one assure that the results of analysis from such a mathematical mode be representative? A justification of such an approach should be provided.

8. On top of page 6.13 it is stated that for load case 3 (Seismic) results are obtained by factoring those of load cases 1 and 2. Since load case 1 deals with dead weight of suppression chamber steel and hydrostatic pressure, explain how the results for the seismic load case can be obtained by factoring the results of dead load and hydrostatic pressure.

9. The 360° beam model as shown Figure 6.1.1-10 has more supports that the actual structure, specifically the single post support at mid span of each torus sector which is not existant in the actual structure. Provide your justification for adding such a support and discuss the effect of such on the behavior of the torus.

10. In Section 6.1.1.3 it is stated that (a) the finite element model of a 1/32 segement of the suppression chamber is used to determine the shell response for dynamic loads, (b) a 360° beam model is used to determine the design forces in the columns, tie plates and earthquake ties., and (c) a finite eleement model of 1/16 segment is used to determine the stresses in the column to shell connection and in the adjacent shell. Provide the reason for not using the 1/32 segment to obtain the results determined by the 1/16 segment, or vice versa. On page 6.17 near the top, for the 1/16 segment analysis you stated that analyses are performed for a thermal expansion load case and for a loading representation of the shell pressure loads from SRV, pool swell and chugging. Indicate how to you obtain such a loading representation. Also indicate if any correlation between the results obtained by the three analyses exsists.

11. In the first sentence on top of page 6.81, it is stated that the effects of 30 psi internal pressure and the SRV pipe support reactions on the vent system are considered by means of hand calculations. Indicate what simplifications or assumptions and the methods of analysis you used in considering the above-mentioned effects in your hand calculations.

12. On top of page 6.82, you used 0.6S mc as the allowable shear stress in fillet weld throats but in accordance with ASME Section III Div. 1 Subsection NE, Section NE-3359 the allowable shear stress in fillet weld should be 0.49 Smc. Provide your justification for using higher allowables. This concern will apply to other sections of the report where this same higher allowable is used.

13. In Section 6.2.1.1 you stated that in the beam model of a 1/16 segment of the vent system, the supppression chamber and vent line and vent line support colums are anlyzed together through the use of beam elements. Since you also made the analysis of a finite element model of the same 1/16 segemnt of the suppression chamber, indicate if any correlation in the results of the two analyses, for instance, the natural frequencies of the two models. If not, how results of the beam model of 1/16 segment of the vent system can be applied to the finite element model of 1/16 segment?

14. In Table 6.2.1-5, indicate the allowable column compressive and tensile loads for the vent header column.

15. Figure 6.2.1-1 shows the distributions of 2.0 kips per downcomer for all downcomers and 3.5 kips per downcomer for 10 downcomers for the analysis for the 360° beam model of the vent system. However, in accordance to section 4.1.5 on page 4.22, four distributions are to be considered. Provide your justifications for not considering the other two distributions.

16. In section 6.2.2.2, design allowables, it is stated that for downcomers to vent header intersection stress allowables with Smc as basis may be replaced with Sy. Provide your justification for adopting such stress criteria. Also indicate how Sml is established.

17. Provide a table to indicate the kinds of steel used respectively for the torus, its supports and its internal structures.

18. Provide sample computations of critical stresses as shown in the tables of the report for various structures or portions of the structures.