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SUBJECT: Provides response to NRC request for addl info re review of Unit 1 torus reduction submittal of 910514.

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September 29, 1993
NMP1L 0784

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

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63
TAC No. M85003

Gentlemen:

Subject: *NRC Request for Additional Information Regarding Re-review of Nine Mile Point Nuclear Station Unit 1 Torus Load Reduction Submittal of May 14, 1991*

By letter dated August 26, 1993, the NRC requested additional information necessary to complete the re-review of our May 14, 1991 request to reduce the condensation oscillation loads in the Nine Mile Point Unit 1 Torus. Attachment 1 to this letter provides our response to the requested information.

If you have any questions regarding the response, please contact W. David Baker at (315) 428-7029.

Very truly yours,

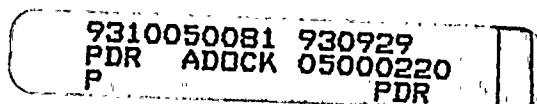


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ADD 1



ATTACHMENT 1

**RESPONSE TO THE NRC REQUEST FOR
ADDITIONAL INFORMATION REGARDING
RE-REVIEW OF MAY 14, 1991,
TORUS LOAD REDUCTION SUBMITTAL
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION UNIT NO. 1
DOCKET NO. 50-220**



RESPONSE TO THE NRC
REQUEST FOR ADDITIONAL INFORMATION
REGARDING REREVIEW OF MAY 14, 1991, TORUS LOAD REDUCTION SUBMITTAL
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION UNIT NO. 1
DOCKET NO. 50-220

In Section 3.3.1 of the Nine Mile Point Plant-Unique Analysis Report of the Torus Suppression Chamber (Teledyne Engineering Services (TES) TR-5320-1, Rev. 1; September 21, 1984), it is stated that controlling load combination for the torus shell is that which combines DBA CO with the DBA hydrostatic pressure (P), deadweight (W) and the OBE (Case 20). The NRC staff requests the following additional information and/or clarification with respect to this statement:

1. What fraction of the total shell stress (membrane, local, etc.) derives from the CO loading? From the P loading? Etc.

Answer:

For Event Combination 20, Element No. 19 (the most limiting element), the stresses from each of the contributing loads are as follows:

Original Analysis, Unreduced CO

<u>Load</u>	<u>Membrane Stress (PSI)</u>	<u>Percent of Total</u>	<u>Membrane + Bend'g (PSI)</u>	<u>Percent of Total</u>
Deadweight	1,756	10.9%	1,812	10.8%
OBE Seismic	205	1.3%	207	1.2%
Internal Pressure (DBA)	9,219	57.0%	9,722	58.0%
<u>DBA CO</u>	<u>4,970</u>	<u>30.8%</u>	<u>5,010</u>	<u>30.0%</u>
<u>Total</u>	<u>16,150</u> (16,025)	<u>100.0%</u>	<u>16,751</u> (16,618)	<u>100.0%</u>
Code Allowable Stress	16,500		24,750	

Note: The stresses in parentheses are from the report (TR-7353-1) and are the principal stresses calculated after all the component stresses from the four load cases are summed. These are lower than the totals obtained by adding the principal stresses from each load case.



2. After Case 20, what load combination involving CO loads induces the next highest stress in the torus shell? What percentage of the total stress is due to CO?

Answer:

The next controlling event combination is Event Combination 14 for limiting Element No. 19, which includes deadweight, OBE seismic, internal pressure, SRV and IBA CO. The stresses from each of the contributing loads are as follows:

<u>Load</u>	<u>Membrane Stress (PSI)</u>	<u>Percent of Total</u>	<u>Membrane + Bend'g (PSI)</u>	<u>Percent of Total</u>
Deadweight	1,756	13.0%	1,812	11.0%
OBE Seismic	205	1.5%	207	1.3%
Internal Pressure (IBA)	9,928	73.4%	10,470	63.6%
SRV	821	6.0%	2,385	14.5%
IBA CO	824	6.1%	1,596	9.6%
<u>Total</u>	<u>13,534</u> (13,232)	<u>100.0%</u>	<u>16,470</u> (15,148)	<u>100.0%</u>
Code Allowable Stress	16,500		24,750	

Note: The stresses in parentheses are the principal stresses calculated after all the component stresses from the five load cases are summed. These are lower than the totals obtained by adding the principal stresses from each load case.

3. What is the worst case load combination involving both CO and SRV loads? What are the stress levels and their split for this case?

Answer:

The worst case load combination, for the limiting element 19, involving both CO and SRV loads is Event Combination 14. See answer to Question 2.



4. What is the worst case load combination for the torus shell that does not involve CO? How are the stresses for that case affected by the thinning of the torus shell? How do they compare with the Case 20 stresses?

Answer:

The worst case event combination that does not involve CO is Event Combination 18 for Element No. 19, which includes deadweight, OBE seismic, and pool swell. The stresses from each of the contributing loads are as follows:

<u>Load</u>	<u>Membrane Stress (PSI)</u>	<u>Membrane + Bending (PSI)</u>
Deadweight	1,756	1,812
OBE Seismic	205	207
<u>Pool Swell</u>	<u>5,968</u>	<u>6,203</u>
Total	7,929 (7,812)	8,222 (8,103)
Code Allowable Stress	16,500	24,750

Note: The stresses in parentheses are the principal stresses calculated after all the component stresses from the three load cases are summed. These are lower than the totals obtained by adding the principal stresses from each load case.

These stresses would increase slightly due to the thinning of the torus shell. However, as can be seen, these stresses are approximately half the Event Combination 20 stresses, so the latter would control by a wide margin.

Referring now to Section 5.3 of TES TR-7353-1, Rev. 2 (January 14, 1992), provide the following information/clarification:

5. Is the statement that "...Event Combination 20...is controlling" valid for both 8 and 4 downcomer bays? How is this established?

Answer:

Yes. It is established by comparing the stresses from the Event Combinations presented herein. (See response to question 8).

6. What shell thickness is used to calculate each of the "actual" stress levels tabulated in this section?

Answer:

The original thickness is used, $t = 0.46$ inches.



...

7. Is the split in stresses due to the various contributing loads identical for the thinner shell case? If it is not, state the fractional distribution.

Answer:

Yes. It would be the same.

8. Is the split in stresses due to the various contributing loads identical for the 4 downcomer bay cases? If it is not, state the fractional distribution?

Answer:

For Event Combination 20, Element No. 19, with reduced CO, the stresses from each of the contributing loads are as follows:

Reduced CO, 8 Downcomer Bays

<u>Load</u>	<u>Membrane Stress (PSI)</u>	<u>Percent of Total</u>	<u>Membrane + Bend'g (PSI)</u>	<u>Percent of Total</u>
Deadweight	1,756	11.3%	1,812	11.3%
OBE Seismic	205	1.3%	207	1.3%
Internal Pressure (DBA)	9,219	59.4%	9,722	60.3%
DBA CO	4,342	28.0%	4,381	27.1%
<u>Total</u>	<u>15,522</u>	<u>100.0%</u>	<u>16,122</u>	<u>100.0%</u>
	(15,452)		(16,044)	
Code Allowable Stress	16,500		24,750	

Reduced CO, 4 Downcomer Bays

<u>Load</u>	<u>Membrane Stress (PSI)</u>	<u>Percent of Total</u>	<u>Membrane + Bend'g (PSI)</u>	<u>Percent of Total</u>
Deadweight	1,756	12.1%	1,812	12.0%
OBE Seismic	205	1.4%	207	1.4%
Internal Pressure (DBA)	9,219	63.5%	9,722	64.3%
DBA CO	3,349	23.0%	3,375	22.3%
<u>Total</u>	<u>14,529</u>	<u>100.0%</u>	<u>15,116</u>	<u>100.0%</u>
	(14,460)		(15,040)	
Code Allowable Stress	16,500		24,750	

Note: The stresses in parentheses are from the report (TR-7353-1) and are the principal stresses calculated after all the component stresses from the four load cases are summed. These are lower than the totals obtained by adding the principal stresses from each load case.



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9. Provide the equivalent response to questions 2 and 3 for the 4 downcomer bays.

Answer:

Event Combination 20 is the only case involving DBA CO loads. The next controlling event combination is Event Combination 14 which includes IBA CO. This is also the worst case event combination involving both CO and SRV loads. Since the load reduction being sought is only for DBA CO, there are no changes to the original values for the IBA CO results for Event Combination 14. That is to say, there is no differentiation between the 4 and 8 downcomer bays for event combinations other than the revised Event Combination 20. The results are presented in Question 2.



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