

POWER AUTHORITY OF THE STATE OF NEW YORK

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August 10, 1979  
JPN-79-47

Director of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Mr. Thomas A. Ippolito, Chief  
Operating Reactors Branch No. 3  
Division of Operating Reactors

Subject: James A. FitzPatrick Nuclear Power Plant  
Docket No. 50-333  
Supplemental Information in Support of  
Request for Plant Start-up

Dear Sir:

This letter provides additional information to fulfill commitments made in the Authority's letter of August 2, 1979 and in response to verbal requests made by the NRC staff on August 7, 1979.

A discussion of the conservative nature of assumptions used in our seismic analysis concerning the suppression chamber water level was requested and is furnished in Attachment 1.

The Authority's August 2, 1979 letter committed to provide, prior to start-up, a schedule to complete pipe support evaluations not completed at the time of start-up. This schedule, provided in Attachment 2, assigns priority to complete one of each redundant safety train expeditiously.

In analyzing the 96 piping runs, some were analyzed with the assumption that the supports were rigid. An evaluation will be initiated on or about November 1, 1979 to assess the effect of using the actual support stiffnesses for those supports originally assumed to be rigid.

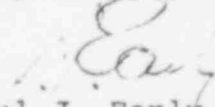
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The Authority's August 2, 1979 letter committed to complete analysis and any necessary modifications for the 28 remaining pipe supports associated with the high pressure core injection system and the reactor core isolation cooling system prior to start-up to meet DBE criteria. To date, 23 of the 28 supports have been determined to be within allowable stress limits. Analysis of the remaining five supports is continuing.

Very truly yours,



Paul J. Early  
Assistant Chief Engineer-  
Projects

PJE:rz  
Attachments

## ATTACHMENT 1

### DISCUSSION OF CONSERVATIVE NATURE OF ASSUMPTIONS CONCERNING SUPPRESSION CHAMBER WATER LEVEL

Amplified response spectra (ARS) at the suppression chamber (torus) were developed based on the dynamic characteristics of the structure and the specified ground response spectra. Studies were made to evaluate the effect of water content inside the torus on its seismic responses (FSAR 12.5.1.3). It was concluded that the chamber would be subject to higher seismic load during Design Basis Earthquake (DBE), if it was assumed "flooded". For the Operating Basis Earthquake (OBE) case, the chamber was assumed "half full". These two cases stretched from one bound to the other as far as the natural frequency of the system is concerned. Since piping was analyzed both for OBE and DBE, the piping was considered to be qualified for these two bounding cases.

If the DBE is postulated to occur when the chamber is only "half full", the seismic effect on piping may be accurately and conservatively estimated by extending the data generated for OBE. The mathematical model is identical, and the DBE ground response spectrum is equal to the OBE multiplied by a constant factor, assuming the same damping coefficient. Consequently, the amplified response spectrum and hence the stresses and loads for DBE must be equal to those of the OBE spectrum multiplied by the same constant factor for the same damping coefficient. This factor is the ratio of the maximum ground accelerations of DBE and OBE; i.e.,  $0.15/0.08 = 1.875$ . In fact, since the damping coefficient for DBE should be twice as much as for OBE, the actual ratio would be less than 1.5.

An ARS curve developed for the torus full of water will have a peak value considerably higher than a curve developed for the torus only half full of water. The concern expressed by the NRC staff was that the frequency of the ARS peak will shift and a piping system resonance which would hit an ARS peak based on a half full torus would miss the ARS peak based on a full torus.

Based on the above concern, the eleven cases potentially affected by the torus ARS were reexamined. The conclusions were:

- a. In seven of the eleven cases, piping system natural frequencies already coincided with the peak ARS values for both the DBE and OBE cases. Therefore, use of an ARS with a different (higher) frequency spectrum but lower maximum amplitude, should reduce the loadings. These are cases 650, 682, 643, 693, 694, 647 and 667.

- b. In two of eleven cases, the piping natural frequencies do not coincide with the existing DBE peak nor would they coincide with the DBE ARS peak based on a half full torus. Therefore, stresses and loads resulting from use of revised DBE ARS curves would be lower than were calculated using existing ARS curves. These cases are cases 740 and 912.
- c. In two cases (cases 668 and 733), the piping frequencies, mode shapes and participation factors were such that it was not absolutely clear that existing analyses, based on the torus full of water, were totally conservative. Therefore, these cases using a DBE ARS predicated on a half full torus were reanalyzed. It was demonstrated that all pipe stress, nozzles, penetration and supports were within code allowables.

Based on the above, we have concluded that the analyses based on the torus water levels specified in the FSAR are valid and conservative.

ATTACHMENT 2

SCHEDULE TO COMPLETE REMAINING PIPE  
SUPPORT EVALUATIONS

PRIORITY I - "A" Safety Train Systems

Start - August 15, 1979 - Complete - September 15, 1979

<u>Case Number</u>	<u>Number of Supports to be Evaluated</u>
<u>Residual Heat Removal</u>	
641	17
637	2
643	11
647	8
864	20
866	3
877	4
878	1
880	6
888	5
879	4
948	5
951	5
<u>Core Spray</u>	
669	4
674	2
<u>Service Water</u>	
863	0
865	8
874	21
875	4
876	3
881	2
900	30
901	14

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<u>Case Number</u>	<u>Number of Supports to be Evaluated</u>
<u>Reactor Bldg. Cooling Water</u>	
872	3
873	2

Total Number of  
Priority I Supports  
to be Evaluated 184

Note: Completion of these cases will result in at least one  
train of all redundant safety-related systems having  
been evaluated.

PRIORITY II - "B" Safety Train Systems  
Start - September 15, 1979 - Complete - September 22, 1979

<u>Case Number</u>	<u>Number of Supports to be Evaluated</u>
<u>Residual Heat Removal</u>	
646	19
867	1
868 }	3
869 }	3
870	3
871	7

<u>Core Spray</u>	
673	0
934	5

Total Number of  
Priority II Supports  
to be Evaluated 38

PRIORITY III - Start - September 22, 1979 - Complete - October 13, 1979

<u>Case Number</u>	<u>Number of Supports to be Evaluated</u>
<u>Standby Gas Treatment</u>	
941	1
942	4
<u>Fuel Pool Cooling</u>	
947	11
949	6
950	0
952	5
953	4
<u>Drywell Vent &amp; Purge</u>	
733	2
740	0
893	8
894	3
894X	6
912	0
<u>Standby Liquid Control</u>	
931	11
<u>Fire Protection</u>	
916	23
917	9
918	12
919	21
920	15

Total Number of  
Priority III Supports  
to be Evaluated

141

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