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SEP 24 1974

Docket No. STN 50-508/509

R. C. DeYoung, Assistant Director
for Light Water Reactors, Group 1
Directorate of Licensing

WPPSS NUCLEAR PROJECT NO. 3 (WPPSS UNITS 3 & 5)
PRELIMINARY SAFETY ANALYSIS REPORT, FIRST ROUND REVIEW

Plant Name: WPPSS Nuclear Project No. 3
Licensing Stage: First Round Review of the PSAR
Project Number: STN-50-508/509
Responsible Branch and Project Manager: LWR 1-3, P. D. O'Reilly
Requested Completion Date: September 27, 1974
Applicant's Response Date Necessary for Completion of Next Action
Planned on Project: December 10, 1974
Description of Response: Answers to Questions
Review Status: Complete

The first round review of the subject application has been completed by the Structural Engineering Branch and we find that additional information is required before we can complete our review. The additional information requested, which concerns structural aspects, is contained in the enclosure. Please note that our acceptance review questions 3.5 (1) and 3.8.2 (1) have not yet been answered.

R. R. Maccary, Assistant Director
for Engineering
Directorate of Licensing

Attachment:
As Stated

cc w/o attach:
A. Giambusso
W. G. McDonald

cc w/attach:
S. H. Hanauer, DRTA
F. Schroeder, L
K. R. Goller, L
P. D. O'Reilly
L. Shao, L
I. Sihweil, L

Memo. 4

OFFICE ▶	L:SEB I.S. x7807	L:SEB	L:AD/E			
SURNAME ▶	ISihweil da	LShao	RRMaccary			
DATE ▶	9/16/74	9/24/74	9/24/74			

13.0 STRUCTURAL ENGINEERING BRANCH

13.1 (3.3.2.2) The procedures presented in this section for combining the various effects of the design basis tornado are not sufficiently explicit. In particular, expand the procedures to show how these effects are combined to produce the most adverse total response of structures or portions thereof. Also indicate that the effects of (a), (c) and (d) of Section 3.3.2.1 will be combined and not (a), (b) and (c) as indicated.

13.2 (3.3.2.3) Indicate if the Turbine Administrative and Service Buildings will be designed for the design basis tornado to satisfy the stipulation of Section 3.3.2.3 and if so, to what extent.

13.3 (3.5.4.1) Describe more explicitly the procedures that will be utilized in designing a roof slab or a wall panel for missile impact near the support where shear effects may govern the design.

13.4 (RSP) (3.7.1.2) The period intervals at which the spectral values of the design time history are computed, as indicated in Section 3.7.1.2, are not in accordance with the Regulatory Staff position which lists the following intervals as a minimum:

Frequency Range (hertz)	Increment (hertz)
0.2 - 3.0	0.10
3.0 - 3.6	0.15
3.6 - 5.0	0.20
5.0 - 8.0	0.25
8.0 -15.0	0.50
15.0 -18.0	1.00
18.0 -22.0	2.00
22.0 -34.0	3.00

Indicate that the increments you are proposing will produce equally or more conservative results otherwise revise your procedures and utilize the above-listed increments.

13.5 (3.7.1.6) Indicate if the more than 70'-0 of soil backfill surrounding the auxiliary building is considered in the seismic analysis of the structure, as seems to be indicated by the spring at elevation 360'-0 shown in Figure 3.7-19. If so, describe the procedures utilized for representing this fill and discuss the expected effects it may have on the response of the structure and equipment.

13.6 (RSP) (3.7.2.1) Where the time-history method of analysis is used, the combination of the responses to the three components of the earthquake may be based on the SRSS method only if the maximum response to the three components is the objective, whereby the maximum response to each component is utilized in the combination. If the combined time-history is the objective, the three time-histories should be combined algebraically at each time step. Indicate your intent to comply with this position and revise the third paragraph of Section 3.7.2.1 accordingly.

13.7 (3.7.2.1) In your response to Q.1 on Section 3.7.1, provide justification for not incorporating the NSSS seismic model (mass and stiffness) in the seismic model of the interior structures.

13.8 (3.7.2.1) The containment shell is represented by a stick model in Figure 3.7-19. In view of the fact that the polar crane is supported on the shell, indicate if the ovalling modes of response of the shell could be excited significantly and if not provide the bases for arriving at such a conclusion.

13.9 (3.7.2.6) The information provided in Section 3.7.2.6 is not sufficient. Describe the procedures that will be used in developing floor response spectra including the combination of the three components of the earthquake and in particular the considerations given to floor response in one direction due to input in another direction.

13.10 (RSP) (3.7.2.7) The conclusion arrived at in Section 3.7.2.7 may not be always true. Indicate what is meant by "within a building". For example, the differential displacement between the top of the steam generator and the next anchor point of the steam line may not be that insignificant to the response of the steam line. Clarification and additional justification should be provided for this section.

The Staff's position on design criteria to account for relative displacements between component support points is as follows:

Where the response spectrum method is used, the procedure involves two steps: First, a static analysis is made by considering the maximum relative displacements between support points; i.e., the design displacement is obtained by adding the absolute sums. Second, a dynamic analysis is made assuming no relative displacement between support points, but using the worst floor response spectrum when the support points are in the same structure, where the worst floor response spectrum can be easily identified, or the enveloped floor response spectrum when the support points

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State your intent to conform to the Regulatory staff position as stated above or describe and provide justification for any exceptions to the position.

13.11 (3.8.2.1) It is stated in Section 3.8.2.1.1 that the containment shell provides vertical support for the proposed 300 ton polar crane bridge. Confirm that the containment shell will also provide lateral support to the crane and provide the following:

a. General details of the crane bridge supports including the rail, ring girder, and brackets.

b. A discussion of the loads and combinations thereof for which the connection to the containment will be designed including the allowable stresses.

c. The treatment given to the expected radial differential displacements between the crane support and the containment shell.

13.12 (3.8.2.1) Identify the containment penetrations that will be designed to withstand jet forces to satisfy the third stipulation of Section 3.8.2.1.2 (a) and describe with the help of sketches the procedures of such a design.

13.13 (3.8.2.1) Provide details and all the pertinent information on the design of the multi-ply primary bellows that form containment boundary as shown in Figures 3.8-1 and 3.8-2 and discussed briefly in Section 3.8.2.1.2 (c) and (d).

13.14 (3.8.2.3) Identify the operating conditions which can result in the external pressure on the containment (identified as Ps in Section 3.8.2.3.1) and indicate if it will be accompanied by any temperature changes and, if so, justify the omission of this thermal load from the combinations that contain P_s.

13.15 (3.8.2.3) For load combinations (a) (1) and (a) (2) of Section 3.8.2.3.2, justify the use of the operating thermal loads at the penetrations in lieau of the loads associated with Ta which may be higher for pipes with relatively low temperatures.

13.16 (3.8.2.3) For load combinations (3) and (4) of Section 3.8.2.3.2, justify the use of P_o in lieau of a higher pressure that will be associated with a rupture at, for example, a steam line penetration.

13.17 (3.8.2.3) For load combination (d) (1) of Section 3.8.2.3, justify the omission of T_t, the temperature load associated with Pt, if expected during the test.

13.18 (3.8.2.3) Justify the omission of a load combination representing the external pressure, P_s, with the SSE.

13.19 (3.8.2.4) Since there are no apparent mechanical connections between the internal concrete and the concrete underlying the bottom head of the containment, the loads will be transferred from the interior concrete to the underlying concrete through the containment bottom head either through bearing or through shear friction. Describe the procedures and treatment of this aspect of the design.

13.20 (3.8.2.7) Describe the construction sequence of the bottom head of the containment and the measures that will be taken to preclude any voids in the underlying concrete.

13.21 (3.8.3.1) Provide general details of the removable shield blocks above the reactor nozzles and describe the analysis procedures and design measures taken to preclude these blocks from becoming missiles. Also describe the pressure-time load in the annulus around the primary pipes and the jet load that might impinge on these blocks in conjunction with the pressure.

13.22 (3.8.3.4) Provide the following information for the primary shield wall:

a) The accident pressure-time curve and the accident temperature gradient, if any.
b) The operating thermal gradient and a description of any cooling system provided.

13.23 (3.8.3.4) Provide the accident pressure-time curve for the secondary shield walls and the time curve for any jet loads that might impinge on these walls and discuss the analytical techniques utilized to obtain the equivalent static loads due to these effects.