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AUTH.NAME AUTHOR AFFILIATION
CURTIS,N.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
PARR,O.D. Light Water Reactors Branch 3

SUBJECT: Responds to request by S Miner to compare subj units SES containment design loads due to loss-of-coolant-accident w/loads used by 3 lead MK II plants.

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TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

cc-R. M. Gallo - USNRC
P.O. Box 52
Shickshinny, PA 18655

February 2, 1979

Mr. Olan D. Parr, Chief
Light Water Reactors Branch No. 3
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
CONTAINMENT DESIGN LOADINGS
LOSS-OF-COOLANT ACCIDENT
ER 100450 PLA-317 FILES 172, 841-2

DOCKET NOS. 50-387
50-388

Dear Mr. Parr:

We have been requested by your Mr. Sidney Miner to compare the Susquehanna SES containment design loads due to a Loss-of-Coolant Accident (LOCA) with those loads used by the three lead MK II plants. (Zimmer, LaSalle and Shoreham)

This comparison is attached. The basis for the comparison is as follows:

1. SRSS is acceptable for SRV loadings and for the structures, and BOP piping and equipment.

2. The lead plant positions are as they were stated in the October 19, 1978 meeting; any further discussions with the lead plants and any resulting modifications to their positions have not been included in this comparison.

In summary, Susquehanna basically follows the lead plant approach in either accepting or rejecting NRC positions except for vent lateral loads.

We would be happy to answer any questions you may have on this comparison.

Very truly yours,

N. W. Curtis
Project Director-Susquehanna

WEB:jm
Attachment

BOSE 1/1

REVIEW OF SUSQUEHANNA S.E.S. UNITS 1 & 2 DESIGN AGAINST

N.R.C. ACCEPTANCE CRITERIA - NUREG 0487

LOCA LOADINGS

LOADING	LEAD PLANT	LONG TERM PROGRAM	S.S.E.S. UNITS 1 & 2	REMARKS
I.A. Water Clearing	33 psi bounding load is to be applied to base mat only. Clarification	DFFR Methodology to be clarified based on data from 4T and EPRI tests.	Used DFFR Methodology - Results in 22.4 psi on base mat only.	Can accept Lead Plant criteria position.
I.B.1.a Bubble Pressure	Acceptable	Acceptable	DFFR 2 was used.	Same position as Lead Plants.
I.B.1.b Pool Swell Height	Shoreham to present generic position per response to question 020.68. Acceptable for Zimmer and LaSalle.	Approach in response to question 020.68 to be used for long term program. NRC criteria not applicable to pedestal interior where no downcomers exist.	Used 1.5 X Submergence. NRC criteria would result in higher pool swell and some problems.	Same position as Shoreham.
I.B.1.c Pool Swell Velocity	Factor of 1.1 is not appropriate considering basic conservatism of postulated drywell pressurization for test. Constant maximum velocity not appropriate. Discussion Requested.	Factor of 1.1 not appropriate considering basic conservatism of postulated drywell pressurization for test. Constant maximum velocity not appropriate.	NRC criteria would cause higher loads on few beams.	Same position as Lead Plants.
I.B.1.d Pool Swell Acceleration	Acceptable	Acceptable	Used DFFR 2 & NEDE-21544P.	Same as Lead Plants.

LOADING	LEAD PLANT	LONG TERM PROGRAM	S.S.E.S. UNITS 1 & 2	REMARKS
I.B.1.e Pool Swell Air Compression	Acceptable	Acceptable	Used DFFR & NEDE-21544P.	Same as Lead Plants.
I.B.1.f Pressure Time Histories	Acceptable	Acceptable	Time histories provided by GE. Based on NEDM-10320.	Same as Lead Plants.
I.B.2 Load on Submerged Boundary	Acceptable	Acceptable	Used DFFR & NEDE-21544P but only to original height of water.	Reanalyze for loads up to pool swell height. Same as Lead Plants.
I.B.3.a Impact Loads Small Struct.	Further analysis has been performed to show DFFR adequate for Lead Plant structures. Discussion Requested.	Dynamic pool swell impact methodology will be developed in the Long Term Program.	Used load shape as defined in DFFR.	Same as Lead Plants.
I.B.3.b Impact Loads Large Struct.	Acceptable	NRC criteria not applicable to pedestal interior where no downcomers exist (See I.B.1.b).	No large structures in pool swell.	Same as Lead Plants.
I.B.3.c Impact Loads Grating	Zimmer and LaSalle have no installed grating in the pool swell zone. Acceptable to Shoreham	Multiplier for standard grating to accommodate small dynamic effect is not appropriate considering basic conservatism of postulated drywell pressurization used to establish pool velocity.	Have only 2 small grating platforms in pool swell.	Same as Lead Plants.
I.B.4.a Wetwell Compression Wall Loads	Acceptable	Acceptable	NRC criteria Acceptable	Same as Lead Plants.

LOADING	LEAD PLANT	LONG TERM PROGRAM	S.S.E.S. UNITS 1 & 2	REMARKS
I.B.4.b Uplift Press.	Acceptable	Acceptable	Can withstand 2.5 psi per NRC criteria.	Same as Lead Plants.
I.B.5 Asymetric Pool Swell	Uniform mixing in the drywell precludes uneven vent clearing. Discussion Requested.	Uniform mixing in the drywell precludes uneven vent clearing.	NRC criteria unrealistic.	Same as Lead Plants.
I.C.1.a Lateral Bracing Load	Acceptable for static analysis.	Dynamic loading specification is being developed during Long Term Program. Task A.13	Cannot accept NRC criteria. Used A.13 forcing functions.	Does not agree with Lead Plant. Does agree with Long Term Program.
I.C.1.b Multivent Lateral Load	Acceptable	Multiple vent bracing loads are no greater than for single vent. Basis, Task C.7	Have applied A.13 loads conservatively & used SRSS.	Does not agree with Lead Plant. Does agree with Long Term Program.
I.C.2.a High Steam Flux	Acceptable	Use DFFR, Rev. 3	Used application memo & DFFR - Rev. 2.	Long Term Program to verify forcing function.
I.C.2.b Med. Steam Flux	Acceptable	Acceptable	Used application memo & DFFR - Rev. 2.	Long Term Program to verify-forcing function.
I.C.2.c Low Steam Flow	Acceptable	Refined chugging definition is being developed during Long Term Program. Task A.6, A.11 and A.16	Chugging Loads obtained using DFFR & App. memo.	Same as Lead Plants.

LOADING	LEAD PLANT	LONG TERM PROGRAM	S.S.E.S. UNITS 1 & 2	REMARKS
III.A.1 LOCA Water Jet	Will address criteria by proposing corrected equations in 1.a and 1.b, submit prelim. ring vortex model and supporting subscale bench mark test.	Ring vortex model including potential function for induced flow will be developed and a more appropriate acceleration drag consideration identified during long term program. WPPSS plant unique model will be provided. Task A.5	New model using ring vortex approach seems valid. Don't anticipate any problems handling vortex loads.	Same position as Lead Plants.
III.B.1 LOCA Air Bubble	(a) Acceptable	(a) Acceptable	Acceptable	Same as Lead Plants.
	(b) Identify more appropriate acceleration drag coefficient treatment than factor of 3.	(b) Identify more appropriate acceleration drag coefficient treatment than factor of 3.	Drag factor should be redefined.	
	(c) Demonstrate that acceleration at center of structure is technically correct. Demonstrate that error resulting in velocity at center vs. maximum velocity is small and bounded by conservatism in velocity applied. Thus simplified DFFR approach is acceptable.	(c) Demonstrate that acceleration at center of structure is technically correct. Demonstrate that error resulting in velocity at center vs. maximum velocity is small and bounded by conservatism in velocity applied. Thus simplified DFFR approach is acceptable.	Drag factor should be redefined.	Same as Lead Plants.
	(d) Demonstrate that factor of (e) 4 is not technically correct for standard drag. Ref. question response to 020.70. Interference effects on acceleration drag will be analyzed on a plant unique basis.	(d) Demonstrate that factor (e) of 4 is not technically correct for standard drag. Ref. question response to 020.70. Interference effects on acceleration drag will be analyzed on a plant unique basis.	Drag factor should be redefined.	Same as Lead Plants.
	(f) Acceptable	(f) Acceptable	Acceptable	Same as Lead Plants.