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MIDDLE SOUTH UTILITIES SYSTEM

October 24, 1980

W3P80-0051
3-A1.01.04
3-A12.05

Mr. R. J. Bosnak, Chief
Mechanical Engineering Branch
Division of Engineering
United States Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: Waterford 3 SES
Action Items From Docket No. 50-382
Status Report Meeting With MEB

Dear Mr. Bosnak:

Attached please find the action items from the subject meeting on Waterford 3 (held at Ebasco Services Inc., NY, on September 30, 1980 through October 3, 1980). Also, attached is a copy of the slides used in the piping preoperational vibration test program and asymmetric loads presentations.

LP&L, Ebasco and CE are proceeding with their resolution of the status report open items in accordance with the attached. LP&L will submit two FSAR Amendments addressing the open items, the first in November and the second in December.

Please reply to us with your comments or concurrence.

Yours very truly,

L. V. Maurin
Project Director

LVM/RWP/ddc

cc: w/attach., D. L. Aswell, A. Schwencer (DL-NRC), W. Kane (DL-NRC), D. Terao (DE-NRC), R. Nanstad (ORNL), R. K. Stampley, J. Costello, F. J. Drummond, R. W. Prados, Central Records, w/o attach., E. Blake, W. M. Stevenson, L. Constable, K. Iyengar

Action Items

General

December commitments will be satisfactory to NRC. It will provide adequate time for NRC to conduct review and support 6/81 SER.

These open items will be placed in the FSAR's Response to NRC Questions volume, and will reference changes to appropriate FSAR sections.

Item	Commitments
1,4	1. For Class 2, 3 and NNS see part b of Resolution of Item 1 and 4. 2. For Class 1, Table 3.6-AA plus a column for peak stress will be sufficient response. 3. Interactions of jets with HVAC will be resolved in 12/80 Amendment. 4. Applicant stated that an as built stress analysis is performed and break locations are confirmed. Any new locations (i.e. not close to previous break locations) are analyzed for the pipe rupture effects. 5. FSAR p. 3.6-35, the words "will be" will be changed to "is".
2	Resolution as stated is acceptable. A copy of Fig. 3.6A-36c was given to NRC/ORNL at meeting. Applicant will expand this response to include a discussion of the separation of this piping from safety-related components.
3	1. Applicant will add clarification on FSAR p. 3.6-33 that penetrations 10 and 11 are moderate energy. 2. Applicant will provide statement in FSAR Subsection 3.6.2.1.4 to indicate that Break Exclusion is applicable to Main Steam and Feedwater lines only. 3. Sample Tables were supplied at the meeting.
4	See Item 1
5	1. CE showed NRC/ORNL a figure from CENPD-168A showing arrangement of primary system restraints, saddles etc. 2. CE provided NRC/ORNL with the stress survey results for Waterford-3 on 10/1/80 in order to demonstrate that the differences between Waterford-3 design and the CENPD-168A model are negligible. NRC/ORNL accepted this response.

Item	Commitments
6,7,8	General Ebasco indicated that ETR 1002 was submitted to NRC in 11/74 and latest revision (3) was submitted in 11/77. This topical has also been submitted on the Shearon Harris, St Lucie 2 and WPPSS 3 and 5 dockets. Ebasco provided MEB reviewers with a copy of Appendix C. This will enable NRC to start review prior to incorporation of Appendix C into November amendment. The responses to Items 6, 7 and 8 are satisfactory but will be ampliefied as follows: 1. Appendix C of ETR-1002 will be incorporated into FSAR. It will be indicated therein specifically where applicable. 2. MS and FW programs for forcing functions are referenced in Subsection 3.6.2.2. No further amplification or changes necessary. 3. Assumed initial operating mode will be described in general for each case analyzed per ETR 1002 Appendix C will be presented in FSAR. 4. For CE, full power is assumed. This will be indicated in text. 5. In amplification of Item 7, the FSAR will be amended to indicate where limited separation has been considered.
9	Response is acceptable supplemented by the following: 1. Applicant will provide statement in FSAR on how design basis limiting strain for piping and restraints was chosen. 2. R C Iotti to provide FSAR write-up Moody Multiplier vs. discharge coefficient.
10, 11	Editorial comments. They will be resolved next amendment.
12	Revised Resolution acceptable to NRC.

Item	Commitments
13	This resolution was acceptable with the exception that the word "(LOCA)" on FSAR page 3.9-20 will be deleted.
14	1. Applicant will provide NSSS answer after CE receives a report from Byron Jackson. 2. For non-NSSS, applicant will add columns to table 3.9-BB showing isometic number, the ratio of 3 Sm to the stress range, etc. See table attached to the resolution.
15, 16	General R C Iotti made a presentation on the piping preoperational vibration test program. Handouts describing the program were given to NRC/ORNL at the meeting (see attached slides) 1. Applicant will submit a description of the program and its acceptance and rejection criteria in a December 1980 FSAR Amendment. 2. The acceptance/rejection criteria will be 50 percent of the alternate stress amplitude at 10^6 cycles as shown in the Code tables.
17, 21, 41	General Asymmetric Loads R C Iotti, Ebasco, made a presentation on the applicant's proposed method of addressing the Asymmetric Loads issue. It demonstrates the conservatism of the Waterford-3 design to that assumed in the generic plant analysis. Copies of the slides presented are attached. 1. NRC requires written principles and bases for conclusions. Applicant will submit this as an Amendment to the FSAR. 2. NRC requires a list of which breaks govern each component. 3. NRC agreed that the additional analyses required for fuel could be limited to a single limiting cold leg vessel inlet break.

Item	Commitments
17, 21, 41 (cont'd)	4. Ebasco will provide information on effects of the Asymmetric Load pipe break case on the ECCS pipe supports. 5. Applicant will amend table 3.9-7 to indicate that it does not include Asymmetric Loads.
18	In the first paragraph of FSAR Section 3.9.3.1 the following sentence shall be added: "Regulatory Guide 1.48 was issued in 1973. As an acceptable alternative the loading combinations described in Section 3.9.3.1.1. below were considered." NSSS Supplied Valves Modify first sentence to read: "In addition to meeting ASME Code Requirements, ..." Non-NSSS Supplied Valves 1. Second page, second paragraph after list of valve vendors, first sentence will be modified to read: "Stresses are calculated in accordance with the rules of the ASME Code Section III Subsection NB and verified to be within the limits of the Code. 2. Last paragraph of second page, fourth line should be: NC-3500 and ND-3500; last sentence should be 3.9-7.
19	1. In FSAR Subsection 3.9.3.1.1.4 the word "considered" will be replaced with "specified". 2. A sentence shall be added to Subsection 3.9.3.1.1.4 referencing Section 3.6A for a discussion of pipe break effects. See revised response.
20	1. Acceptable as revised except that: 2. CE will provide a Code reference for Sm used.
21	See Item 17
22, 23	Acceptable as is.

Item	Commitments
24	A statement will be made in both the NSSS and Non-NSSS sections to indicate that an evaluation has been made to ensure that active pumps and valves will operate under all transients for which they are required.
25	Acceptable as is.
26	1. Item (a) of proposed resolution will be finalized following discussions between CE and Ingersoll-Rand. 2. Item (b): Add sentence "Comparisons of these values with FSAR Figure 3.7-15 demonstrates the conservatism of these accelerations." 3. Change third column heading in part (c) to read "Maximum Allowable Load as specified by Vendor."
27	Resolution Acceptable as revised.
28	1. A sentence will be added in the FSAR to indicate that the FSAR's report of operability of Limitorque operators is a generic type test and is representative of the operators used on Waterford 3. 2. Ebasco (Ihor Sydoriak) will provide a revised part (c) for CE's review. CE later stated that they have the generic Limitorque report, and will provide revised part (c) themselves. 3. First paragraph of part (a) will be deleted. The revised response to #24 will be inserted here. 4. CE will provide a statement in part d for inclusion in the response on the operability of diaphragm operated valves.

Item	Commitments
29	1. In part (a) of response, reference will be made to the appropriate section of the FSAR where operability considerations are discussed. 2. In part (a) the words "including operability" has been deleted.
30	Response will read: "Operability of safety valves for their intended service is assured as described in Resolution to Item 24.
31	Resolution is Acceptable. Table 3.9-10 will be completed in a December 1980 amendment.
32	Resolution is Acceptable.
33	Resolution is Acceptable. The FSAR will be updated to include the information contained in the resolution.
34	1. The second paragraph in the Resolution will be changed to read: "Code Class 2 Safety & Relief Valves were analyzed to meet S Values in Table I-7.1 (as applicable) from the appropriate ASME Code for all operating conditions at the minimum cross-section of the inlet neck for the following loads taken concurrently: Discharge Forces + Spring Forces + Internal Pressure + (The greatest of either SSE, Hurricane, Tornado, or Explosion Forces). There are no other applicable design basis events." 2. FSAR Table 3.9-11 will be revised to include stress due to thrust of relief valve for Safety Class 2 Valves under upset, emergency, and faulted conditions. For Class I Valves, the table will be revised to include loading combinations for the stress levels.
35, 36	Resolution is Acceptable.

Item	Commitments
37	Resolution is Acceptable. FSAR pages 3.9-48 and 3.9-49 will be amended (Dec 80) to include valves as per resolution.
38	Resolution is Acceptable. The FSAR will be amended as per resolution.
39	Ebasco will amend resolution to reference papers which show that the water slug forces are not greater than the valve reaction forces in open systems.
40	Applicant will revise FSAR Subsection 3.9.3.3. as per resolution.
41	See Item 17
42	Resolution will be supplied in Dec 1980 Amendment.
43	Ebasco/CE will compile a table similar to Table 3.9-7 for other components. Ebasco will review FSAR Table 3.9-7 to evaluate removing the last load set for the upset condition and the entire Emergency Load Sets. Table 3.9-7 will be revised to: a) Change title to "Design Loading Combinations and Stress Limits for ASME Code 2 and 3 Piping." b) Delete the OBE Load for the normal condition. Add OBE to first equation of the upset condition. c) Delete the phrase "(For Piping Only)" in notes 3 and 4.
44	Resolution is acceptable pending revision to Appendix 3.9B.
45	Revision to Appendix 3.9B mentioned in second paragraph of resolution will be submitted in a December 1980 Amendment.

Item	Commitments
46	1. Appendix 3.9B will be revised to include the information listed in the response. 2. A column for design temperature will be added to Table 3.9-7. 3. Acceptable as is. Applicant will however add a statement in FSAR that IE Bulletin 79-02 has been addressed.
47	1. Ebasco will review FSAR Subsection 3.9.3.4. to ensure that all component supports are considered and will include a table listing the loading combinations for the supports. 2. In addition, the last paragraph on FSAR page 3.9-50 will be revised to read: "The stress limits of Table 3.9-CC are greater than or equal to the stresses resulting from the loading combination of thermal plus deadweight plus OBE plus any other mechanical loads (as specified in Table 3.9-7)". A new table (revised Table 3.9-CC) will be added to indicate loading combinations and design stress limits for Class 1, 2 and 3 component supports.
48	Acceptable as is.
49	1. Applicant will provide some information regarding mechanical snubbers as has been presented for hydraulic snubbers in response to NRC questions 110.3. 2. It should be noted that the resolution provided applies to both mechanical and hydraulic snubbers.
50	At the meeting with CE and Ebasco on October 2, a copy of calculated stresses and code allowable stresses was shown to the NRC. The

Item	Commitments
50 (cont'd)	highest value of stress limit shown was 99.9 ksi for the motor housing. 1. What is the value of Sm on which this is based? 2. Can the NRC have a copy of the data that was shown to them, so they can review it? 3. What are the materials? The last sentence of the proposal resolution should include the following words: "for non-pressure parts." SEE ATTACHMENT.
51	Acceptable as is.
52	The proposed resolution covers the effects of distortion. What are the effects of changes in pressure drop?
53, 54	Acceptable as is.
55	Last paragraph of resolution has been changes to read: "Insertion times during small line breaks LOCA conditions are less than the times considered in the analyses."
56	The proposed resolution covers lifetime. What is the effects of the increased travel on the drop time?
57	Following revisons have been made to this resolution: 1. Add following paragraph "See revised FSAR Subsection 3.9.5.1.4.1." 2. Add to FSAR "(vertical)" after "... structure" in first two items under "Location" column.
58	1. Last sentence in second paragraph is changed to: "A test, for the worst offset conditions, was performed to show that the CEDM could meet these requirements".

Item	Commitments
58 (cont'd)	2. Revise by adding to the last sentence "including bowed CEA guide tubes." However, CE stated that this statement is not applicable and thus was not added.
59	Acceptable as is.
60	1. Add paragraph: "See revised FSAR Subsection 3.9.4.3. 2. On page 3.9-54 of FSAR, add to item b: "(including turbine trip and loss of coolant flow)".
61	1. Change second sentence to: "The holdown ring (as shown in Figure 61-1) is positioned ....." The figure has been provided. 2. Add the following sentence to the end of the paragraph: "The holdown ring vertical forces transmitted to the vessel head have been included in the vessel head bolting analysis."
62	Add following sentence: "The reactor pressure vessel is weld overlayed at the factory with Inconel, for welding on the Inconel flow skirt."
63	1. NRC withdrew part e of the item. 2. Change part a, first paragraph, second sentence to the following: "A vertical gap of ½ inch hot and 1 inch cold is provided ....." 3. Change first sentence of part b to: "..... lower flange (see Figure 3.9-4, Detail A)." 4. Change second sentence of part b to: "the material of the lower support structure and the core support barrel is 304 stainless steel and the temperature difference is small. The radial and axial differential expansion is taken up by the flexure."

Item	Commitments
63 (cont'd)	5. Change the first paragraph of part c to: ".... the design provides axial and radial clearance at the ...."
	6. Delete second sentence of part d.
	7. Part b) of resolution. Delete "and axial" from the last sentence. The flexure joint between the lower support structure and the core support barrel is designed for radial flexibility only.
64	1. Last sentence of resoluton added: "The alignment keys are designed to provide restraint during SSE and other loading conditions.
	2. Typographical error. The words "based on field data. By design the gaps at the alignment keys" have been omitted from the third sentence.
65	1. Change second paragraph, second sentence to: "...Stress intensities (see Table 65-1)."
	2. The applicant will supply Table 65-1 in Dec 80. The table will given the max calculated and max allowed stress for the following items, under SSE+LOCA Loads (excluding Asymmetric Loads): Alignment Keys Core Support Structure (at point of maximum stress) T Beams
66	Add following sentence: "SSE Loads are considered only in connection with LOCA Loads."
67	Add in parenthesis after "shock loads" on FSAR page 3.9-63 the following: "loads resulting from dropping control elements during a scram."

Item	Commitments
68	Change second sentence to read: "These stresses limit deflections to the elastic range and they are within the limits of functional acceptability."
69	Change "break" to "breaks".
70	Acceptable as is.
71	Add the following sentence: "The internals of Waterford 3 are identical to those of San Onofre 2 & 3."
72	ISI Inspection of Code Class 1, 2 and 3 Pumps And Valves This item was discussed from the point of view of what NRC requires and by when. It was not anticipated that this item would be closed out at this time. R Bosnak discussed intersystem LOCA which was identified in WASH 1400. NRC's revised SRP 3.9.6 Appendix A and NUREG 0677 identify what NRC will be looking for regarding intersystem LOCA. It was suggested that Pump and Valve PSI/ISI be broken out from the rest of the ISI program and given some priority (ie, possibly submitted 12 months prior to fuel load) so that MEB has sufficient time to review the exceptions to ASME Section XI. If the pump and valve ISI program cannot be completed 12 to 6 months prior to fuel load, a list of areas where LP&L requires relief will be helpful to MEB. NRC indicated that the ISI procedures would not be required for them to perform their review under SRP 3.9.6. Mr Tony Cappucci is an NRC contact for Pump and Valve ISI.
73	1. Applicant will reorganize and revise FSAR Section 3.7.3.1.1 to appropriately integrate the revisions to the response described herein. 2. Ebasco selected a system analyzed by the chart method and explained the method to the NRC.

Item	Commitments
73 (cont'd)	3. Question 73 d was deleted.
	4. Reword last sentence of c to read: In all cases the design temperature is less than 275°F and the maximum pipe diameter is 3 inches. All code Class 3 chilled water piping is analyzed by the chart method.
	5. Applicant will give line numbers for pipes done by chart method and cross reference the flow diagram.
	6. Applicant has run a sample case for Waterford 3 to demonstrate that differences in frequency responses between lumped mass model and model taking into account the valve eccentricity is negligible on valve larger than 2 inches. The results were given to NRC.
	7. Applicant will modify Insert A of resolution to state that the information given is for Class 1, 2 or 3 portions of the applicable system only and will also add a column to the table to indicate whether method b or c was used for Safety Class 2 or 3.
	8. Applicant will revise FSAR p. 3.7-14 (Para. 2 and 3) to change the word "spectrum "to" spectra."
	9. Applicant will revise and annotate list of systems to be consistant with system names used in the FSAR and will indicate if the only portion analyzed was that between the containment isolation valves.
74	The Resolution and Applicant Commitments to Item 73 will provide an acceptable Response to Item 74.
75	The analysis comparing the chart and the modal methods was reviewed at the meeting on 10/1 and a copy was given to the NRC.
76	This item is no longer applicable as per response to Item 73.

Item	Commitments
77	This open item has been withdrawn by the NRC.
78	Magnitude of the relative displacements between Structures on the mat was presented to NRC on 10/1. J Damitz will provide maximum relative displacement between piping systems and justify why they can be neglected. This will be submitted in FSAR.
79	1. This resolution was accepted by NRC/ORNL after Ebasco showed examples of what we mean by frequency analysis versus modal analysis. Applicant will state in the FSAR that a frequency analysis was done in all seismic category I piping and shows that no system has a period greater than 0.20. Ebasco showed the NRC a sample frequency analysis at the meeting. 2. Applicant will define frequency analysis in FSAR (NRC suggested Section 3.7.3.5). Applicant will describe how results show rigidity that simplified static method can therefore be used. 3. Applicant will define in FSAR what is meant by period of the supporting structure.
New Item	
1	During the meeting, NRC's R Bosnak introduced a new item concerning code stamping of ASME Code Class 3 components. Mr Bosnak stated that LP&L's recent letter to NRC (LPL 14099, dated June 2, 1980) did not adequately address all concerns raised in NRC's letter to LP&L from R L Baer (Dated February 7, 1980). In summary, while the physical application of an N-symbol on a Class 3 component is not mandatory, this required that Quality Group C (ASME Class 3 components) be constructed in a manner equivalent to that obtained by otherwise fully complying with the ASME Code. ASME Code construction require mandatory third party inspection and accompaning code data reports.

New Item	Commitments
1 (cont'd)	Mr Bosnak stated to the best of his knowledge that Waterford 3 was unique in the industry in this matter. In later discussions, Mr Bosnak advised that LP&L should provide the following information for the Emergency Feedwater and Component Cooling Water Systems, so that this matter could be evaluated jointly by I&E and NRR. Item 1 - Identify all Class 3 components and their manufacturer. Item 2 - State that the manufacturer has the proper ASME Certificate of Authorization, including the certificate number, and the period for which the certificate is valid. Also, the date of fabrication of the complete component should be identified. (This will indicate whether or not the component was manufactured during the period in which the Certificate of Authorization was valid). Item 3 - Submit the certificates of compliance or certified material test reports. Item 4 - Submit code data reports with third party inspection sign-off if available. LP&L questioned Mr Bosnak since Regulatory Guide 1.26 (Revison 2, dated June 1975) permits not applying the ASME code N-symbol on Class 2 and 3 components. Mr Bosnak advised that this was not intended to permit the utility to construct these components to a system not equivalent in all elements to that of the ASME System. A vital element of the ASME System is third party inspection by an authorized Nuclear Inspector. Regulatory Guide 1.26 only eliminates the need to physically stamp the components. All other code requirements are still required.
2A	Augmented ISI Program for Pipe included in Break Exclusion zones. November submittal will contain applicants commitment and indicate exceptions with justification. This will be placed in FSAR Sections 3.6 and 6.6.8 per NRC's request.

New Item	Commitments
2, 3	General R Bosnak stated that MEB's scope has been expanded with the NRC reorganization and that draft SER sections were prepared but not forwarded to LP&L. He highlighted the more important new open items (2 and 3) as follows:
2	FSAR Section 3.2 1. R Bosnak stated that NRC does not accept Section 2.3.1.1 of ANSI N-18.2 relative to the use of normally open remote closure valves for RCPB isolation. Only automatic valves are permitted for this service. Ebasco will review and see if there is any problem with Section 2.3.1.1 relative to the Waterford design. 2. NRC stated that per 10CFR50.2v all portions of RCPB should be Quality Group A except for these portions excluded by the footnote in 50.55a which are Quality Group B. 3. Footnote 9 of Table 3.2-1 will be revised to state that the Feedwater lines are seismic Category I up to the restraint at column line G as shown on Figure 1.2-8.
3	Refer to FSAR Subsection 17.2.2.2; Applicant should modify Table 3.2-1 to include a column which indicates which components were included under the Appendix B QA Program, or alternately states that all seismic Category I Structures, System and Componenets received the full Appendix B QA program. In either case, all systems and components covered by the QA Program should be included in Table 3.2-1.