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January 8, 1980

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Olan D. Parr, Chief
Light Water Reactor Branch 3
Division of Project Management

Gentlemen:

RESPONSE TO REQUESTS FOR
ADDITIONAL INFORMATION
NO. 2 UNIT
SALEM NUCLEAR GENERATING STATION
DOCKET NO. 50-311

Public Service Electric and Gas Company hereby transmits 60 copies of its response to Question 4.39 "Use of the WESAN Computer Code in the Subcompartment Analysis" and Question 4.40 "Information Regarding the Critical Buckling Criteria Used in the Subcompartment Analysis."

Should you have any questions, please do not hesitate to contact us.

Very truly yours,

R. L. Mittl
General Manager -
Licensing and Environment
Engineering and Construction

Enclosure

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QUESTION 4.39

The Public Service Electric and Gas Company report, "Evaluation of the Reactor Coolant System Considering Subcompartment Pressurization Following a LOCA for Salem Units 1 and 2" was submitted to the staff on March 6, 1979 and revised on March 29, 1979. Section 6.1 of this report states that the computer program WESAN was used to analyze the steam generator and reactor coolant pump supports for the effects of asymmetric pressure loads combined directly with LOCA loop depressurization loads. Provide the design control measures as required by Appendix B of 10 CFR Part 50, that were used to demonstrate the applicability and validity of the WESAN program. These control measures should meet one of the following criteria:

1. The computer program is recognized and widely used, with a sufficient history of successful use to justify its applicability and validity without further demonstration. The dated program version that will be used, the software or operating system, and the hardware configuration must be specified to be accepted by virtue of its history of use.

2. The computer program solutions to a series of test problems with accepted results have been demonstrated to be substantially identical to those obtained by a similar program which meets the criteria of (a) above. The test problems shall be demonstrated to be similar to or within the range of applicability for the problems analyzed by the computer program to justify acceptance of the program.

3. The program solutions to a series of test problems are substantially identical to those obtained by hand calculations or from accepted experimental tests or analytical results published in technical literature. The test problems shall be demonstrated to be similar to the problems analyzed to justify acceptance of the program.

A summary comparison of the results obtained from the use of the WESAN computer program under options (b) or (c) above with either the results derived from a similar program meeting option (a), or a previously approved computer program, or results from the test problems of option (c) shall be provided. They should include representative comparisons of responses due to static and/or dynamic loading, preferably in graphical form.

ANSWER

Refer to the Public Service Electric and Gas submittal entitled "Explanation and Verification of the Computer Program "WESAN" dated January 8, 1980. This is the program used in the subcompartment analysis for Salem Unit 1 and 2.

QEUSTION 4.40

With respect to the P.G.&E report referenced in Question 4.39, provide the buckling design criteria which was used for all ASME Class 1 component supports subjected to faulted condition loading combinations. Provide justification if your criteria exceeds the limits of Paragraph F-1370(c) of the ASME Section III Code, Appendix F.

ANSWER

The response related to the two-thirds critical buckling criteria is covered in the attached three page changes which are to the March 6, 1979 submittal entitled "Evaluation of the Reactor Coolant System for Salem Unit No. 1 and 2." Please make the following changes to the referred document.

1. Replace Section 6.1
2. Replace Table 8
3. Add Table 8A

6.0. RCS EQUIPMENT

6.1 Steam Generator and Reactor Coolant Pump Supports

The supports were analyzed for the effects of asymmetric pressure loads combined directly with LOCA loop depressurization loads using the computer program WESAN. The program WESAN combines axial and bending stresses according to the procedure defined in the ASME Boiler and Pressure Vessel Code, Section III, Paragraphs XVII-2215.1 and SVII-2215.2. These total LOCA effect loads were combined with seismic loads by the SRSS method. Tables 8A and 8B give maximum member stresses and the ratios of the combined stresses to allowables for critical members of the steam generator and reactor coolant pump supports. The ratios given in the table result from the combination of axial and bending stresses through interaction equations in WESAN. The ratios for the columns are based on the 2/3 critical buckling criteria of Paragraph F-1370(c) of the ASME Code Section III, Appendix F. Included in the Tables are material types and yield stresses. Of the break cases considered, only the governing (maximum) member stress is given. Reference 4 includes mathematical models and drawings for the steam generator and reactor coolant pump supports. As shown in the Tables, the permissible stresses, are greater than the calculated stresses for all members. The permissible stresses are defined in the ASME Boiler and Pressure Vessel Code, Section III, Subsection NF, with faulted condition increase factors. Member 31 on the reactor coolant pump support had a stress ratio of 99% which indicates that the actual stress in the member is below the allowable. Conservatisms in the calculation of stresses, determination of allowable stresses, redundant design of the supports, calculational methods for LOCA and asymmetric pressure loads, and combination of loads provide a large margin between allowable stresses and stresses required to induce failure. The factor that the member stress is less than allowable is sufficient to ensure that the member is adequate for all loadings considered.

TABLE 8

II. Steam Generator Lower Supports

A. Columns

Break	Member	Ratio	Stresses (ksi) Axial	Shear Y	Shear Z	Bending Y	Bending Z	Yield	Material
Hot Leg	72	19.4%	4.22	.00495	.129	1.21	.146	42	ASTM 441
Cold Leg	79	23.4%	4.17	.00495	.140	2.05	.145	42	ASTM 441

B. Frame

Break	Member	Ratio	Axial	Shear Y	Shear Z	Bending Y	Bending Z	Yield	Material
Hot Leg	9	95%	1.17	.287	21.3	17.9	1.92	42	ASTM 441
Cold Leg	30	89.6%	1.03	.501	.134	.919	2.36	42	ASTM 441

TABLE 8 A

a
II. Steam Generator Lower Supports

A. Columns

Break	Member	Ratio	Stresses (ksi) Axial	Shear Y	Shear Z	Bending Y	Bending Z	Yield	Material
Hot Leg	41	35.5%	3.82	0	1.37	8.83	0	42	ASTM 441
Cold Leg	41	77.8%	7.19	.124	.996	20.2	.552	42	ASTM 441

B. Frame

Break	Member	Ratio	Stresses (ksi) Axial	Shear Y	Shear Z	Bending Y	Bending Z	Yield	Material
Hot Leg	40	49.8%	9.21	.330	0	.00435	10.4	42	ASTM 441
Cold Leg	31	99%	33.3	.856	.0679	0	6.55	42	ASTM 441

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