

MAY 02 1985

DCB 016

Docket No.: 50-443 and 50-444

MEMORANDUM FOR: Thomas M. Novak, Assistant Director
for Licensing
Division of Licensing

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FROM: Robert J. Bosnak, Acting Assistant Director
for Components and Structures Engineering
Division of Engineering

SUBJECT: SEABROOK NUCLEAR STATION UNIT 1 - ARBITRARY INTERMEDIATE
PIPE BREAKS - REVISED SER

- References:
1. Memo from R. J. Bosnak to T. M. Novak, dated March 18, 1985
Subject: Seabrook Nuclear Station Unit 1 - Arbitrary
Intermediate Pipe Breaks
 2. Letter from J. DeVincentis, Public Service of New
Hampshire (PSNH) to G. W. Knighton, NRC, dated
February 7, 1985, Subject: Elimination of Arbitrary
Intermediate Pipe Breaks
 3. Letter from J. DeVincentis, PSNH, to G. W. Knighton, NRC,
dated April 12, 1985, Subject: Elimination of Arbitrary
Intermediate Pipe Breaks in the Feedwater System

In Reference 1, the Mechanical Engineering Branch forwarded its evaluation of the Public Service of New Hampshire (PSNH) submittal (Ref. 2) dealing with alternative pipe break criteria that would eliminate arbitrary intermediate breaks (AIBs) in all high energy piping systems except the feedwater system at the Seabrook Station, Unit 1. Subsequently in Reference 3, the applicant requested approval for elimination of AIBs in the feedwater system. Based on our review of Reference 3, we have concluded that the applicant's request is acceptable. This approval is applicable to Unit 1 only, since the applicant's submittal gives details of proposed breaks, etc., to be eliminated for Unit 1 and not for Unit 2. To incorporate the feedwater system into our original SER, pages 8 and 9 of Reference 1 have been revised and are attached.

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Robert J. Bosnak, Acting Assistant Director
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Attachment: As stated

cc: See page 2.

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Thomas M. Novak

- 2 -

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where the number of stress cycles, due either to pressure or thermal effect, is relatively large for the expected life of the equipment." Code rules governing the fatigue effects associated with general bending stresses caused by thermal expansion are addressed in NC/ND-3611.2(e) and are generally incorporated into the piping stress analyses in the form of an allowable stress reduction factor.

Thus it can be concluded that when the piping designers have appropriately considered the fatigue effects for Class 2 and 3 piping systems in accordance with NC/ND-3645, the likelihood of a fatigue failure in Class 2 and 3 piping caused by unanticipated cyclic loadings can be significantly reduced.

→ Insert A

Based on the staff evaluation of the design considerations given to Class 2 and 3 piping, the stress limits provided in the SRP break criterion, and the degree of uncertainty in unanticipated loadings, the staff finds that dispensing with arbitrary intermediate pipe breaks is justified for Class 2 and 3 piping in which stress corrosion cracking, large unanticipated dynamic loads, or thermal fatigue in fluid mixing situations are not expected to occur provided 1) the piping designers have appropriately considered the effects of local welded attachments per NC/ND-3645, and 2) all safety-related equipment in the vicinity of Class 2 and 3 piping systems have been environmentally qualified for the non-dynamic effects of a non-mechanistic pipe break with the greatest consequences on the equipment. ~~With the exception of the main feedwater system, the staff has concluded that the above described requirements are present for those ASME Code Class 2 and 3 piping systems identified in the applicant's letters dated February 7, 1985, (References 2 & 5) The applicant is preparing a separate submittal regarding the main feedwater system.~~

and April 12, 1985

Piping Systems Not Included in Proposal

For those piping systems, or portions thereof, which are not included in the applicant's submittals (References 2) ^{and 5}, the staff requires that the existing guidelines in BTP MEB 3-1 of the SRP (NUREG-0800) Revision 1 be met. However, should other piping lines which are not specifically identified in the applicant's submittals (References 2) subsequently qualify for the conditions described above, the implementation of the proposed elimination of the arbitrary intermediate break criteria may be used provided those additional piping lines are appropriately identified to the staff.

Conclusion

The applicant has proposed a deviation from the current guidelines of the SRP by requesting relief from postulating arbitrary intermediate pipe breaks in some high energy piping systems. The applicant has committed to perform pre-^{and 5} operational testing of all the systems identified in References 2, and also monitor those systems for vibration during preoperational and startup testing. The staff has evaluated the technical bases for the proposed deviation with respect to satisfying the requirements of GDC 4. Furthermore, the staff has considered the potential problems identified in NUREG/CR-2136 (Ref. 6) which could impact overall plant reliability when excessive pipe whip restraints are installed. Based on its review, the staff finds that when those piping system conditions as stated above are met, there is a sufficient basis for concluding that an adequate level of safety exists to accept the proposed deviation.

Insert A for P. 8

Because of the susceptibility of main feedwater systems in other plants to water hammer, the applicant has incorporated several water hammer prevention/minimization features into the design of the feedwater piping at the Seabrook Station. The Seabrook steam generators (SG) are Westinghouse Model F type in which feedwater enters at an elevation above the top of the U-tubes through the 16-inch feedwater nozzle. The water is distributed circumferentially within the SG by means of a feed ring. The feedwater enters the ring via a welded thermal sleeve connection and leaves it through inverted J-tubes located at the flow holes that are at the top of the ring. The J-tubes are arranged to distribute the bulk of the colder feedwater to the hot leg side of the tube bundle. The feedring is designed to minimize conditions within the SG which could result in water hammer occurrences in the feedwater piping.

Complying with the Westinghouse recommendations regarding the routing of the feedwater piping, each SG nozzle utilizes a 90-degree elbow connected immediately to a near vertical run of pipe to minimize potential steam voids. Under normal operating conditions, the feedwater flow arrangement ensures that the line is kept filled with water, thus preventing steam from leaking back into the feedwater piping. Also, feedwater control valves (FCV) instabilities have been minimized by ensuring that all components in the system are compatible. To stabilize operation at low power levels, a small bypass control line is provided.

As stated in the Seabrook SER Section 10.4.7, the applicant has agreed to perform tests to verify that unacceptable water hammer will not occur when the plant operating procedures are being used for normal and emergency restoration of SG water level following a loss of normal feedwater. The staff concurs with the applicant's conclusion that the design features and operating procedures described above will minimize the potential for water hammer occurrence in the main feedwater piping system.

Thus, based on the piping systems having satisfied the above conditions, the staff concludes that the pipe rupture postulation and the associated effects are adequately considered in the design of the Seabrook Nuclear Station Unit 1 and, thus, the deviation from the Standard Review Plan is acceptable.

IV REFERENCES

- 1) "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", NUREG-0800 (Revision 1) dated July 1981.
- 2) Letter from J. DeVincentis, PSNH, to G. W. Knighton, NRC, subject, "Elimination of Arbitrary Intermediate Pipe Breaks," dated February 7, 1985.
- 3) Memo dated March 20, 1984 from J. P. Knight to T. Novak, subject, SSER for Catawba 2 on Arbitrary Intermediate Pipe Breaks."
- 4) Memo dated June 22, 1984 from J. P. Knight to T. Novak, subject, "Vogtle Electric Generating Plant - Units 1 and 2, Arbitrary Intermediate Pipe Breaks."

5) "Effect of Postulated Event Devices on Normal Operation of Piping Systems in Nuclear Power Plants", NUREG/CR-2136 dated May 1981.

5) Letter from J. DeVincentis, PSNH, to G.W. Knighton, NRC, subject, "Elimination of Arbitrary Intermediate Pipe Breaks, ^{in the Feedwater System}", April 12, 1985



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAY 20 1985

Docket Nos.: 50-443
and 50-444

APPLICANT: Public Service Company of New Hampshire
FACILITY: Seabrook Station, Unit 1 and 2
SUBJECT: MEETING SUMMARY

On April 1, 1985, NRC, and applicant representatives met in Bethesda, Maryland to discuss the fire protection of safe shutdown capability. The discussion pertained to technical areas in which the Auxiliary Systems Branch (ASB) has review responsibility. Enclosure (1) provides the attendees to this meeting.

The applicant noted that their original report on fire protection of safe shutdown capability was incomplete because at the time decisions on instruments (or design of instruments) in containment had not been made. Also, items outside of containment have been added since the report. The applicant considers the updated report complete and that it identifies deviations and the basis for these deviations. //

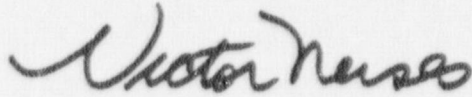
As a result of this meeting the applicant committed to the following actions:

1. To rewrite and complete the justification for the deviation in the mechanical penetration area.
2. To review the emergency feed water fire area justification to determine what if any additional words are needed for further clarification.
3. To revise the Fire Hazards Analysis Report (FHA) pages to delete identification of the Baron Injection Tank (BIT) valves because of the elimination of the BIT.
4. To remove from the FHA any reference to tank farm since the tank farm is not an area needed for alternate capability.
5. To clarify in the FHA the Condensate Storage Tank level location.
6. To remove the Primary Component Cooling Water temperature indicator from pages 3-9 of the FHA.

700

D/12

The staff agreed to formally submit the recent request for additional information that was verbally discussed with the applicant.



Victor Nerses, Project Manager
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Division of Licensing

Enclosures:
As stated

cc: See next page

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Alternate and Safe Shutdown Capability
April 1, 1984

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J. S. Wermiel	NRC/NRR/DSI/ASB
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R. E. Sweeney	NHY, Bethesda Office Mgr.
S. F. Kobylarz	UE&C (WNP#1), observer
David D. Maidrand	YNSD, Asst. Pro., Mgr.
George P. Semienko	YNSD, Mech. Egnineer

MAY 20 1987

MEETING SUMMARY DISTRIBUTION

Docket No(s): 50-443/444

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J. S. Wermiel

bcc: Applicant & Service List

The staff agreed to formally submit the recent request for additional information that was verbally discussed with the applicant.

151

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As stated

cc: See next page

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5/16/85

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