



BOLTON EDISON

Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

February 21, 1992
BECo Ltr. 92-014

Roy A. Anderson
Senior Vice President - Nuclear


U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Docket No. 50-293
License No. DPR-35

Dear Sir:

The enclosed Licensee Event Report (LER) 92-001-00, "Class I Piping Seismic Damping Ratios", is submitted voluntarily.

Please do not hesitate to contact me if there are any questions regarding this report.


R. A. Anderson

JPC/bal

Enclosure: LER 92-001-00

cc: Mr. Thomas T. Martin
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
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Sr. NRC Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)		DOCKET NUMBER (2)	PAGE (3)
Pilgrim Nuclear Power Station		0 5 0 0 0 2 9 3	1 OF 0 5

TITLE (4)
Class I Piping Seismic Damping Ratios

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)	
1	21	99	1992	001	00	02	22	1992	N/A	0 5 0 0 0 0	
									N/A	0 5 0 0 0 0	

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.59. (Check one or more of the following) (11)

OPERATING MODE (9)	N	20.402(b)	20.405(a)	50.73(a)(2)(vi)	73.71(b)
POWER LEVEL (10)	1 0 0	20.405(a)(1)(iii)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A) voluntary
		20.405(a)(1)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(vi)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(vii)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Jeffery P. Calfa - Senior Compliance Engineer	AREA CODE: 5 0 8 7 4 7 - 8 1 0 8

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE): NO:

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On December 19, 1991, the Class I piping seismic damping ratios permitted for use since 1982 were found to not conform with the damping ratios approved by the NRC for use at Pilgrim Station. The damping ratios were increased in two changes to the Final Safety Analysis Report (FSAR). The changes incorporated the damping ratios from NRC Regulatory Guide 1.61 and ASME Section III Code Case N-411. NRC approval for the damping ratio changes was not sought under 10 CFR 50.59 because it was not recognized that the changes could constitute an unreviewed safety question.

This condition was discovered during a review of the main steam line/safety relief valve tailpipe stress analysis. The plant was operating with the reactor mode switch in the RUN position. Reactor pressure was 1035 psig and reactor water temperature was approximately 548 degrees Fahrenheit. The use of the higher damping ratios was determined not to be reportable in accordance with 10 CFR 50.73. This report is submitted voluntarily. The condition poses no threat to the public health and safety.

All piping systems designed or modified using seismic damping ratios greater than the NRC approved FSAR ratios are operable as determined in an operability evaluation approved on January 13, 1992. Long term corrective actions are under development. Currently, planned actions include identification of stress analyses where the higher damping ratios were used, development of enhanced design specifications for piping and supports, and systematic review of safety grade piping systems to demonstrate conformance with the appropriate licensing basis.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

EVENT DESCRIPTION

On December 19, 1991, the Class I piping seismic damping ratios permitted for use since 1982 were found not to conform with the damping ratios approved by the NRC for use at Pilgrim Station. The damping ratios were increased from those approved in two changes to the Final Safety Analysis Report (FSAR). NRC approval for the damping ratio changes was not sought under 10 CFR 50.59 because it was not recognized that changes in damping ratios could constitute an unreviewed safety question. Increased seismic damping concurrent with the plant's seismic response spectra could reduce the conservatism and the margin of safety as described in FSAR Section 12 and Appendix C. These sections of the FSAR describe the analytical methods used and list the ratios as a percentage of critical damping.

The affected items are Class I piping and supports that provide structural and pressure integrity for normal, transient and accident conditions. Systems currently identified to have been designed or modified using the higher damping ratios are the Reactor Water Level piping, the Recirculation System piping, the Main Steam relief valve discharge Lines, the Scram Discharge Volumes, and the Residual Heat Removal system drain lines.

The FSAR changes were made by two 10 CFR 50.59 Safety Evaluations (SEs) which incorrectly determined that NRC approval was not necessary. The first change was pursuant to SE 1421, approved May 24, 1982. The second change was pursuant to SE 1697, approved August 23, 1984. The damping ratios were changed as follows:

	FSAR ORIGINAL		SE 1421		SE 1697
	OBE	SSE	OBE	SSE	OBE AND SSE
≤ 12" Dia	0.5%	1.0%	1.0%	2.0%	Note 1
≥ 12" Dia	0.5%	1.0%	2.0%	3.0%	Note 1

Note 1: For all piping sizes, 5% from 0 to 10 Hz, decreasing linearly to 2% at 20 Hz. This is the ASME Code Case N-411 criteria.

Potential Condition Adverse to Quality (PCAQ) 92-3 and Management Corrective Action Request (MCAR) 92-1 were written to document the use of higher-than-licensed damping ratios. Class I piping evaluated using the higher damping ratios was declared operable based on a NED operability evaluation. This operability evaluation is consistent with the guidelines contained in NRC Generic Letter (GL) 91-18 and was reviewed and recommended for approval by the Operations Review Committee (ORC) on January 13, 1992.

Discovery of the condition occurred during a review of the main steam line/safety relief valve tailpipe stress analysis. The plant was operating with the reactor mode switch in the RUN position. Reactor pressure was 1035 psig and reactor water temperature was approximately 548 degrees Fahrenheit. Reactor Power Level was 100 percent.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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CAUSE

The cause of this condition was personnel error in judgement concerning the proper application of Reg. Guide 1.61 and ASME Code Case N-411. The relationship between damping and response spectra was not clearly defined. The determinations made on the use of higher damping in SE 1421 and SE 1697 reflect the belief that since the technical issues had been resolved, NRC approval was not necessary. The key question in both evaluations was whether the changes decreased the margin of safety as described in the basis of Technical Specifications. The authors and reviewers of both safety evaluations did not recognize the change could result in a decrease in the margin of safety.

SE 1421 justified increasing damping ratios to those contained in NRC Regulatory Guide (Reg. Guide) 1.61, "Damping Values for Seismic Design of Nuclear Power Plants". The higher damping ratios from Reg. Guide 1.61 were apparently meant to be used with the response spectra contained in Reg. Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants". The Standard Review Plan (SRP) in 1975 defined an acceptable design basis for a commercial nuclear power generation facility. The SRP Section 3.7.1 recommends, among other things, the use of Reg. Guide 1.60 for the development of ground response spectra, and Reg. Guide 1.61 for damping ratios.

The requirement to use Reg. Guides 1.60 and 1.61 together was not clear. Furthermore, Pilgrim Station was built prior to the issuance of the SRP. Used together, the Reg. Guides would be a more advanced analytical technique, which would not have reduced the margin of safety. However, Reg. Guide 1.61 used with the original plant design spectra was less conservative. The use of the higher damping ratios with the original plant design spectra could result in a decrease of the margin of safety as described in the basis of Technical Specifications. SE 1421 addressed the technical aspects only. The lack of recognition of the usage requirements of Reg. Guide 1.61 resulted in NRC approval not being sought as required by 10CFR50.59 and 10CFR50.90.

ASME Code Case N-411 adoption was justified by SE 1697 on August 23, 1984. NRC approval for use of ASME Section III Code Cases is delineated in Reg. Guide 1.84, "Design and Fabrication Code Case Acceptability ASME Section III Division 1". Revision 22 of Reg. Guide 1.84 was effective in July 1984. Code Case N-411 is not listed in Revision 22. Section C of that revision states that "code cases not listed herein are either not endorsed or will require supplementary provisions on an individual basis to attain endorsement status". Code Case N-411 was subsequently endorsed in Revision 24 of Reg. Guide 1.84 in June of 1986. Endorsement was limited to those plants that used the "current" seismic spectra. "Current" is interpreted to mean the Reg. Guide 1.60 response spectra. Pilgrim's use of its original spectra may not qualify for use of N-411 under the NRC endorsement. The adoption of Code Case N-411 without specific NRC approval resulted from a misunderstanding of the NRC endorsement requirement.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

CORRECTIVE ACTION

Class I piping evaluated using the higher damping ratios was declared operable based on a NED operability evaluation. This operability evaluation was reviewed and recommended for approval by ORC on January 13, 1992.

Currently, planned actions include identification of stress analyses where the higher damping ratios were used, resolution of discrepancies between the existing design and the regulatory guidelines, development of enhanced design specifications for piping and supports, and systematic review of safety grade piping systems to demonstrate conformance with the appropriate specification. The need for further review of older safety evaluations will be determined under MCAR 92-1.

SAFETY CONSEQUENCES

The use of the higher seismic damping ratios for Class I piping poses no threat to the public health and safety.

All piping systems that have been designed or modified using seismic damping ratios greater than the NRC approved FSAR ratios are operable as defined in Technical Specifications. Consistent with NRC Generic Letter 91-18, the allowable stress limits used to determine operability of the affected piping and related supports at PNPS are based on the requirements of IE Bulletins 79-14, 79-02 and ASME III Appendix F.

There are no special compensatory measures required for continued operation. All the systems in question meet ASME code required safety margins but operation in this condition is limited to one operating cycle.

This LER is submitted voluntarily.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted for similarity to previous Pilgrim Station Licensee Event Reports (LERs) written since January 1984. The review focused on LERs submitted on a voluntary basis or pursuant to 10 CFR 50.73 subparts (a)(2)(ii), (a)(2)(v), and (a)(2)(vii). No events were identified that involved personnel error in performance of safety evaluations.

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ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS

Supports
Pipe

CODES

SPT
PSP

SYSTEMS

Control Rod Drive System (Scram Discharge Volume)
Main Steam System
Primary Containment System (PCS)
Reactor Water Level System
Reactor Recirculation System
Residual Heat Removal

AA
SD
JM
JD
AD
BO