NRC FORM 366 (6-1998)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001
LICENSEE EVENT REPORT (LER)	(See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)

Inability of the Pressurizer Support Bolts to Meet FSAR Requirements

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
										05000
05	25	99	99	-- 006 --	1	10	22	99	FACILITY NAME	DOCKET NUMBER 05000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

OPERATING MODE (9)									
			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)			20.2203(a)(1)		20.2203(a)(3)(i)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER-Voluntary
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
William Heysek, TMI Licensing Engineer	(717) 948-8191

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	No				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

Corrective Action Process form number T1999-0264 was initiated on March 19, 1999 to document preliminary analyses results provided by Framatome Technologies that identified an apparent discrepancy between the pressurizer support lugs and their design basis. Subsequent independent analyses performed by GPU Nuclear determined that while the pressurizer support lugs were not overstressed, the support lug bolt seismic loads exceeded the FSAR design requirements. The deficient condition of the support lug bolts was documented in Corrective Action Process form number T1999-0264 on 05/25/99 and reported to the NRC at 1703 hours on May 25, 1999 as a one-hour report pursuant to 10 CFR 50.72(b)(1)(ii)(B).

An evaluation by GPU Nuclear could not identify the specific cause of this event. Probable causes could be either the inadequate transfer of design information from the Nuclear Steam Supply System supplier to the architect engineer, structural analyses inadequacies for the support or inaccurate design analyses and drawings for the pressurizer.

The corrective action taken by GPU Nuclear involved modifying the pressurizer support attachment arrangement through the installation of lateral restraints at the pressurizer support lugs. The modification, as installed, brought the pressurizer supports into compliance with the TMI-1 design bases.

The deficient condition is being reported per 10 CFR 50.73(a)(2)(ii).

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The plant was operating at 100% power at the time the conditions were determined to be reportable and plant operation was not changed as a result of that determination.

II. STATUS OF STRUCTURES, COMPONENTS OR SYSTEMS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT.

No systems, structures or components were out-of-service that contributed to the condition addressed by this LER.

III. EVENT DESCRIPTION

Preliminary analytical results produced by Framatome Technologies, Inc. , (FTI), identified an anomalous overstress condition in the pressurizer support lugs. Corrective Action Process (CAP) form number T1999-0264 was initiated on March 19, 1999 following assertions resulting from FTI's preliminary analytical calculations that found that the TMI-1 pressurizer supports [AB/PZR SPT] did not meet the Final Safety Analysis Report (FSAR) requirements. As a result of management review team (MRT) action, the CAP was classified as a material nonconformance and a conditional release was issued. Based on engineering judgement, GPU Nuclear determined the pressurizer supports to be operable based on the confidence in the prior analysis results which established the pressurizer support design basis and the uncertainties regarding the current Framatome Technologies' analyses modeling methodology and considerations.

GPU Nuclear met with FTI on March 31, 1999 to review the details of the FTI calculation. Following the meeting between FTI and GPU Nuclear regarding the FTI analysis, an independent analysis was performed by GPU Nuclear. It addressed the conservatisms and modeling considerations used in the FTI analysis. The GPU Nuclear analysis isolated the pressurizer from the RCS, added significant pressurizer detail, recalculated the mass distribution and made accommodations for differences in input regarding the coefficient of friction, support lug and vessel flexibility, and D-ring wall and support steel torsion modeling issues. As a result of the GPU Nuclear analysis, concerns with the pressurizer support lugs themselves were eliminated. However, the lug bolts, although operable, were determined not to be in compliance with the TMI-1 design bases seismic requirements. The extent of the condition was limited to the support lug bolts.

After Engineering determined that the lug bolts did not satisfy the FSAR requirements, the TMI Plant Review Group met on May 25,1999 to review CAP T1999-0264. The GPU Nuclear analyses concluded that the pressurizer support lugs satisfy the TMI-1 FSAR seismic requirements. However, the same analyses concluded the pressurizer support lug bolt seismic loads exceed the TMI-1 FSAR seismic requirements for both an operating basis earthquake (OBE) and a safe shutdown earthquake (SSE), and the pressurizer lug bolts will remain operable during these seismic events. The condition (the pressurizer support bolts being outside the TMI-1 design basis) was reported to the NRC at 1703 hours on May 25, 1999 as a one-hour report pursuant to 10 CFR 50.72(b)(1)(ii)(B).

The conclusion regarding the continued operability of the support lug bolts was reached from the results of analyses utilizing damping values from Regulatory Guide (RG)1.61. Using the damping values contained in RG 1.61 for both building and equipment, the loads on the support lugs yield stresses which are below the TMI-1 FSAR stress limit for an SSE event. Application of the RG 1.61 damping values to this situation is justified. RG 1.60 which describes the shape and magnitude of the seismic input spectrum and RG 1.61 which

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specifies an acceptable set of damping values to use in the analyses of various structures and components are usually approved as a pair for use at a facility. The design response spectrum damping calculations for TMI-1 were based on the capability of the material to absorb energy and produced very conservative results. Issuance of the RGs in 1973, post TMI-1 design, revised prior criteria to include recognition of both the energy absorption capability of a structure and its connections. When the Pressure Vessel Research Committee proposed the use Code Case N-411 of damping values for piping, GPU Nuclear submitted a request and obtained NRC approval to apply them at TMI-1. It is GPU Nuclear's understanding that in the review of N-411 for use at TMI-1, a comparison was made between the actual site design spectrum and the site spectrum that would have been used if RG 1.60 was invoked. Based upon the similarities of the comparison results, NRC approval was granted even though RG 1.60 was not invoked by the TMI-1 FSAR. Hence, GPUN believes that the use of RG 1.61 damping values is entirely appropriate for the operability assessment.

IV. AUTOMATIC OR MANUAL INITIATED SAFETY SYSTEM RESPONSES

No automatic or manual safety system responses were involved with the deficiencies reported herein since there was no physical plant event.

V. FAILURES AND ERRORS

The root cause for the inability of the pressurizer support lug bolts to satisfy the TMI-1 FSAR stress requirements could not be determined. This is due to the time interval between the plant construction design activities and the more recent FTI RCS analyses and GPU Nuclear calculations that identified the deficiency. Probable causes could be either the inadequate transfer of design information from the Nuclear Steam Supply System supplier to the architect engineer, structural analyses inadequacies for the support or inaccurate design analyses and drawings for the pressurizer.

VI. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

Although GPU Nuclear has determined that the pressurizer support lugs are in compliance with the TMI-1 FSAR design bases, it has found that the pressurizer support lug bolts are not. Analyses, incorporating design documentation and assumptions, performed on the pressurizer show that the support lug bolts would be operable during an OBE or SSE event using the less conservative but appropriate RG 1.61 damping values as described in Section III. That operability evaluation was based on the best available design information which was subsequently found to differ from the pre-modification field conditions. A reanalysis of operability will be performed based on field as-built information obtained during the 13R Refueling Outage to confirm the validity of the prior operability determination.

In support of an effort to determine the extent of condition, an engineering review was performed on the other Reactor Coolant System vessels to identify if any similar concerns were present. No additional concerns were identified.

Therefore, there are no safety consequences resulting from the discrepancy between the current TMI-1 design bases and the pressurizer support lug bolts.

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VII. PREVIOUS EVENTS OF A SIMILAR NATURE

There have been no other similar problems identified at TMI-1 which were not later found to be adequate upon a detailed review. This is considered to be an isolated case.

VIII. CORRECTIVE ACTIONS

A. Immediate Corrective Action

Upon determining that the pressurizer support lug bolts do not satisfy the TMI-1 FSAR stress requirements, GPU Nuclear performed an operability review and determined that the pressurizer would remain operable under all required design conditions.

B. Subsequent Completed Corrective Action

During the 13R refueling outage, a modification to the TMI-1 pressurizer support attachment arrangement was completed. The modification, designed to limit lateral motion during a seismic event, involved the installation of lateral restraints (cleats and filler plates) on each of the pressurizer's eight support lugs. The modified pressurizer support structure reduces the seismic stresses in the support components to levels equal to or less than the FSAR requirements when the pressurizer experiences a design basis seismic event. The final installation was inspected by Quality Verification personnel and the installed configuration was verified to be in accordance with engineering direction.

C. Long Term Corrective Action

Any change to the determination of operability resulting from information influenced by the as-built condition will be addressed in a supplement to this report.

* The Energy Industry Identification System (EIIS), System Identification (SI) and Component Function Identification (CFI) Codes are included in brackets, "[SI/CFI] where applicable, as required by 10 CFR 50.73 (b)(2)(ii)(F).