GPU NUCLEAR

GPU Nuclear, Inc.
U.S. Route #9 South
Post Office Box 388
Forked River, NJ 08731-0388
Tel 609-971-4000

October 15, 1998
1940-98-20594

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report 98-11; Three Small Bore Piping Lines did not meet Design Bases Seismic and/or Thermal Allowables

Enclosed is Licensee Event Report 98-11. This event did not affect the health and safety of the public.

If any additional information or assistance is required, please contact Mr. John Rogers of my staff at 609.971.4893.

Very truly yours,

Michael B Roche

Michael B. Roche
Vice President and Director
Oyster Creek

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MBR/JJR
cc: Administrator, Region I
NRC Project Manager
Senior Resident Inspector

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

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TITLE (4)

Three Small Bore Piping Lines did not meet Design Basis Seismic and/or Thermal Allowables

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
09	14	98	98	-- 11 --	00					05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

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

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	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
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		
	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)
Peter Tamburro	609.971.4141

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		02	15	99

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

As a part of ongoing activities to characterize nuclear safety related (NSR) small bore lines at Oyster Creek, three cases were discovered in which NSR small bore lines were not in compliance with Oyster Creek design basis. Specifically, two 1/2" instrument lines on Shutdown Cooling System and a 1/2" instrument line on the Core Spray System did not meet design requirements.

Although the configurations of these lines did not meet design requirements, these lines were determined to be operable per the guidelines in GL 91-18 Rev 1. Therefore, these lines would fulfill their NSR function of either maintaining primary containment or pressure integrity. The safety significance of these non-conforming conditions has been determined to be minimal as the lines met operability criteria and would not fail during any design basis event These lines will be modified to meet design basis requirements. After the remaining program walkdowns are completed, the sample population will be analyzed to determine if the results statistically characterize the entire population of NSR small bore lines. Any additional corrective actions will be reported by a revision to this LER.

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

DATE OF DISCOVERY

The conditions described herein were discovered on September 14, 1998, and verified to be reportable on September 28, and 29, 1998.

IDENTIFICATION OF OCCURRENCE

Walkdown, analysis, and calculation identified that the configuration of two 1/2" lines on Shutdown Cooling System (EIIS: BO) and a 1/2" line on the Core Spray System (EIIS: BM) do not meet B31.1-1955 requirements, as modified by GPUN licensing commitments that reduce occasional load stress allowables. Therefore, these lines do not meet design code requirements and are not in compliance with descriptions in the FSAR. This condition is reportable under 10 CFR 50.73(a)(2)(ii).

CONDITIONS PRIOR TO DISCOVERY

The plant was operating at approximately 100% power at the time of discovery. However, the plant has operated in all modes with these lines in these conditions.

DESCRIPTION OF OCCURRENCE

In June 1997, a plant deviation report raised four concerns as to whether nuclear safety related (NSR) small bore piping at Oyster Creek, met B31.1-1955 seismic and thermal requirements as described in the Oyster Creek UFSAR. In response to the deviation report, GPUN developed a program intended to evaluate whether applicable NSR small bore lines were in compliance with design bases.

The program determined the design basis for NSR small bore piping, determined which systems were in scope, developed a walkdown program with screening criteria, and chose lines based on statistical sampling for the walkdowns. A stratified random sampling scheme was designed to characterize compliance to design bases for each system, and for design and functional requirements of each line. The configuration of each line would be documented as part of the walkdown methodology. Screening criteria were established to disposition lines in the field during the walkdowns. Lines that met the screening criteria would then be dispositioned as having met code requirements. Lines that did not meet the screening criteria would be analyzed at a later date using the configuration documented during the walkdowns.

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TEXT CONTINUATION

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DESCRIPTION OF OCCURRENCE (CONT.)

Approximately 63 lines which were accessible during power operations were walked down during May and June of 1998. Approximately two thirds of these lines met the screening criteria and did not require further action. The remaining lines, referred to as outliers, were then modeled. Approximately 18 additional lines, which were not accessible during power operations, were walked down during the current 17R refueling outage.

Preliminary results from the May and June walkdowns are described below:

1) On September 28, 1998, a preliminary calculation concluded that the configuration of the two 1/2" lines in the Shutdown Cooling System did not meet B31.1 requirements. The configurations of these lines were identical and connect FE-17-3 to the "C" loop flow element located downstream of V-17-57. Analysis of these specific lines showed non-compliance to B31.1 stress requirements for thermal expansion and anchor motion. The first clamp supports on each line were located too close to the 8" large bore Shutdown Cooling line to accommodate the large vertical anchor motion of the 8" line. Modeling showed that the removal of these clamps would bring the two lines into code compliance.

2) On September 29, 1998, a preliminary calculation concluded that the configuration of a 1/2" line on the Core Spray System did not meet B31.1 requirements. This line connects FIT-RV26A to the System I Flow element. Modeling of this specific line showed non-compliance to B31.1 stress requirements for thermal expansion. The 1/2" line, which is tubing, ran within a 1/4" clearance at the bottom and side of a structural concrete beam. The thermal and seismic motions of the 14" large bore Core Spray System line to which this tubing is connected causes the 1/2" tubing to interfere with the structural concrete beam. This results in an over-stress condition on some of the fittings on the 1/2" tubing.

3) Based on preliminary calculations and walkdown packages, the remaining lines which were walked down in May and June of 1998 have been found to be in compliance with design basis.

Generic conclusions with respect to all NSR small bore lines cannot be addressed at this time as the analysis of the 17R refueling outage walkdowns has not been completed. Additional deficiencies which may be discovered as a result of the 17R walkdowns and generic conclusions will be reported by a revision to this LER. However very preliminary indications are that there are no additional lines that do not comply with design basis.

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

APPARENT CAUSE

The apparent cause of the non-compliance of the of the two 1/2" lines on Shutdown Cooling System was a design deficiency in which the thermal and seismic motions of the main 8" Shutdown Cooling line was not thoroughly considered in the support of this 1/2" tubing. The apparent cause of the non-compliance of the of the 1/2" Core Spray System line was a design deficiency in which the thermal and seismic motions of the main 14" Core Spray line were not thoroughly considered in the routing of 1/2" tubing. Also poor installation practices were considered to be a contributing cause for the Core Spray System line.

These two cases, and the original cases which initiated the deviation report, indicated that the original design approach for small bore piping at Oyster Creek did not give appropriate consideration of thermal and seismic anchor motions. Based on a review of Oyster Creek's original design documentation, the design approach used for class I small bore piping appears to be consistent with the licensing/design basis. Specifically, original design documentation indicated that the deadweight, seismic, and thermal analysis were implemented. However, it appears that the original design approach for thermal and seismic anchor motions of large bore piping attachments was based on good engineering judgement/installation practices, instead of reviews of predicted large bore piping motions.

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

Although the configuration of the two 1/2" Shutdown Cooling lines and the 1/2" Core Spray line did not meet B31.1 code design requirements, these lines were found to be operable per the guidelines in Generic Letter 91-18, Rev. 1. Maximum calculated stresses were below the ASME Section III Appendix F operability criteria. Therefore, these lines will fulfill their nuclear safety related function of either maintaining primary containment or pressure integrity, however they presently do not meet the design basis.

The safety significance of the non-conforming conditions has been determined to be minimal as the lines met operability criteria and would not fail during any design basis event.

CORRECTIVE ACTIONS

1) The two 1/2" Shutdown Cooling System lines and the 1/2" Core Spray System line will be modified during the present 17R refueling outage to meet code requirements. In the case of the two 1/2" Shutdown Cooling lines, modeling indicates that the removal of one clamp on each line will bring the configuration into compliance. The 1/2" Core Spray System line will be rerouted for an approximate 4' length to clear the interference with the structural concrete beam.

2) Once all the walkdowns are completed, the sample population will be analyzed to determine if the results statistically characterize the entire population of NSR small bore lines. Additional corrective actions will be reported by follow-up to this LER.

SIMILAR EVENTS

LER 98-010; Diesel Generator Switchgear found Beyond Design Bases due to Inadequate Installation During Original Construction

LER 97-015; Static Time Delay Units Not Mounted in Accordance with Seismic Qualification Criteria due to Improper Installation