CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9703170139 DOC.DATE: 97/03/10 NOTARIZED: NO DOCKET #
FACIL:50-220 Nine Mile Point Nuclear Station, Unit 1, Niagara Powe 05000220
AUTH.NAME AUTHOR AFFILIATION
YAEGER,W.R. Niagara Mohawk Power Corp.
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-001-00:on 970206,determined that pipe supports failed to meet design criteria for seismic loads.Caused by design deficiency.Will modify affected supports during next refueling outage.W/970310 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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CATEGORY 1 DOCUMENT

NIAGARA MOHAWK
GENERATION
BUSINESS GROUP

NINE MILE POINT NUCLEAR STATION/LAKE ROAD, P.O. BOX 63, LYCOMING, NEW YORK 13093

March 10, 1997
NMP1L 1194

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

RE: LER 97-01
Docket No. 50-220

Gentlemen:

In accordance with 10CFR50.73(a)(2)(ii)(B), we are submitting LER 97-01, "Pipe Supports Outside Design Basis Because of Design Deficiency."

Very truly yours,

Norman L. Rademacher

Norman L. Rademacher
Plant Manager - NMP1

NLR/AFZ/kap
Enclosure

xc: Mr. H. J. Miller, Regional Administrator
Mr. B. S. Norris, Senior Resident Inspector
Records Management

IE22 1/1

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION	APPROVED OMB NO. 3150-0104 EXPIRES: 4/30/92
LICENSEE EVENT REPORT (LER)	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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Nine Mile Point Unit 1	5000220	1 OF 5

TITLE (4)
Pipe Supports Outside Seismic Design Basis Because of Design Deficiency

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 NAMES	DOCKET NUMBER(S)
02	06	97	97	001	00	03	10	97	N/A	05000
									N/A	05000

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check one or more of the following)* (11)			
POWER LEVEL (10) 100	☐ 20.402(b)	☐ 20.405(c)	☐ 50.73(a)(2)(iv)	☐ 73.71(b)
	☐ 20.405(a)(1)(i)	☐ 50.36(c)(1)	☐ 50.73(a)(2)(v)	☐ 73.71(c)
	☐ 20.405(a)(1)(ii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(vii)	☐ OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*
	☐ 20.405(a)(1)(iii)	☐ 50.73(a)(2)(i)	☐ 50.73(a)(2)(viii)(A)	
	☐ 20.405(a)(1)(iv)	☒ 50.73(a)(2)(ii)	☐ 50.73(a)(2)(viii)(B)	
	☐ 20.405(a)(1)(v)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
W. R. Yaeger, Manager Engineering NMP1	(315) 349-7834

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐ YES *(If yes, complete EXPECTED SUBMISSION DATE)*	☒ NO				

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

On February 6, 1997, with Nine Mile Point Unit 1 (NMP1) in the RUN mode and reactor thermal power at approximately 100 percent, Niagara Mohawk determined that 16 pipe supports in the Reactor Building Closed Loop Cooling System (RBCLC) inside the drywell did not meet the design basis criteria for seismic loads as descried in the Updated Final Safety Analysis Report (UFSAR). This deficiency was identified as a result of a design Analysis being performed as part of the corrective actions previously identified in voluntary Licensee Event Report (LER) 96-09, concerning potential overstressed pipe supports in RBCLC.

The apparent cause of this event is a design deficiency resulting from the design methods used in the original design of RBCLC piping and supports.

The RBCLC system has been determined to be operable. Engineering Analysis had demonstrated that the piping will remain intact and capable of performing its safety function after a design basis seismic event. The affected supports will be modified during the next refueling outage.

I. DESCRIPTION OF EVENT

On February 6, 1997, with Nine Mile Point Unit 1 (NMP1) in the RUN mode and reactor thermal power at approximately 100 percent, Niagara Mohawk determined that 16 pipe supports in the Reactor Building Closed Loop Cooling System (RBCLC) inside the drywell did not meet the design basis criteria for seismic loads as described in the Updated Final Safety Analysis Report (UFSAR). This deficiency was identified as a result of a design analysis being performed as part of the corrective actions previously identified in voluntary Licensee Event Report (LER) 96-09, concerning potential overstressed pipe supports in the RBCLC system.

LER 96-09, submitted on October 21, 1996, identified a potential for overstressing pipe supports as a result of thermal stresses resulting from a Loss of Coolant Accident (LOCA). The design analysis process used the MPR Associates piping analysis "PIPEMASTER" computer program to evaluate the piping and pipe supports. When the LOCA thermal stresses were being evaluated, a review was performed of the design basis load combinations. The results indicated that some supports do not meet the seismic design basis criteria.

II. CAUSE OF EVENT

The apparent cause of this event is a design deficiency resulting from the design methods used in the original design of the RBCLC supports. RBCLC is a low pressure and low temperature piping system for which adequate thermal flexibility was given by the piping layout without computer analysis. For supporting dead weights of the pipe system, rules, guidances, and recommended hanger spacing of ASA B31.1 were followed. For the design of seismic restraints and their spacings, the calculational methods and charted span were employed. In the late 1960's, the side load capacities of U-bolts were substantially higher than determined later by testing performed by manufacturers such as Grinnell. The current analysis uses load capacity data sheets and design report summaries for nuclear qualified U-bolts based on manufacturer's testing and qualification completed in the 1980's.

The apparent cause is considered to be a design deficiency resulting from use of the original design methods, primarily those associated with U-bolt side load capacity. The evaluation results also indicated that there were other design assumption deficiencies as some welds or other non-standard components were identified where stresses exceeded design basis allowables.

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Nine Mile Point Unit 1	05000220	97	-	01	-	00	03 OF 05

TEXT (If more space is required, use additional NRC Form 366A's) (17)

III. ANALYSIS OF EVENT

This event is being reported in accordance with 10CFR50.73(a)(2)(ii)(B), "Any event or condition that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant."

The RBCLC is a closed loop system inside the containment, however, the piping must remain intact in order to maintain containment integrity, and to supply the critical loads outside the drywell. Although some of the pipe supports could be overstressed during a design basis seismic event, the engineering evaluation demonstrates that the stresses are within the operability allowables of ASME Section III, Appendix F, and no piping failure occurs. Therefore, the piping will remain intact and operable.

The need for an investigation for seismic deficiencies in other safety related systems was also evaluated. Considering the factors discussed in the following paragraphs, Niagara Mohawk concluded that this issue is not generic, and is unique to RBCLC. Therefore, further investigation of other systems for seismic deficiencies was not initiated.

The RBCLC piping layout (for both 4" and 8" lines) inside the drywell consists of a ring piping around the reactor. As discussed in the "Cause of Event" section, the original design and installation is assumed to be a simplified approach that was used in the 1960's as no design records could be located. No computer piping analysis was done for this ring piping in the 1960's, as it was a low pressure and low temperature system. There were no U-bolt lateral load capacity data sheets available in the 1960's.

The current piping analysis performed by using PIPEMASTER software is based on state of the art techniques that considered, among other factors, an exact modeling of the ring piping, the exact material properties, stress intensification factors, documented seismic "g" values, and specific gaps around the U-bolts. Ring piping responds in a different way compared to a simple straight span and, therefore, this computer based analysis yielded conservative results compared to the possible hand calculations that were performed in the original design.

The only other ring piping system inside the drywell is Containment Spray, for which the analysis of the original design was performed using computer software. Also, the Containment Spray piping does not have standard U-bolts and is more flexible compared to RBCLC piping. Therefore, the identified deficiency is considered an isolated case limited to RBCLC only, and is not considered generic in nature.

In response to NRC Bulletin 79-14, Niagara Mohawk performed an evaluation of as-built conditions against design inputs related to seismic requirements. As a result of this evaluation, no non-conformances were identified which would have resulted in a review of the subject piping system's design calculations. The

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III. ANALYSIS OF EVENT (Cont'd)

actions required by Bulletin 79-14 focused on verification that actual plant conditions were consistent with design documents and inputs, and these actions would not have resulted in identifying this discrepancy in the original design.

The Niagara Mohawk evaluation demonstrates that stresses are within the operability allowables of ASME Section III, Appendix F, and that no piping failure would occur. Furthermore, this situation had no adverse affect on any other safety system nor the operators' ability to maintain safe reactor plant conditions. This situation did not adversely affect the health and safety of the general public or plant personnel.

IV. CORRECTIVE ACTIONS

1. The 16 supports that exceed the UFSAR design basis allowable stresses for seismic loads will be modified during Refueling Outage 14. These modifications will also include any remaining work needed to meet the post-LOCA thermal stresses as identified in LER 96-09.

2. A review of other potentially affected systems within the drywell was completed, and no additional unacceptable situations were identified.

3. An engineering evaluation of the containment spray piping within the drywell was performed, which verified the adequacy of piping and supports for design basis loads.

4. The design basis load combinations for safety related systems were reviewed, and no additional load combination deficiencies were identified.

5. A review will be performed to verify that adequate calculations and/or design information is available for other safety related systems to assure that seismic design of piping and supports has been properly established. Any deficiencies identified will be documented and evaluated in accordance with the corrective action program. Completion date: September 1, 1997.

This deficiency occurred during the original design of NMP1. Engineering procedures, methods, and design controls have been significantly enhanced since that time and are now considered adequate to prevent recurrence.

NRC FORM 366A U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

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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Nine Mile Point Unit 1	05000220	97	-	01	-	00	05 OF 05

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V. ADDITIONAL INFORMATION

A. Failed components: none.

B. Previous similar events: none.

C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 FUNCTION	IEEE 805 SYSTEM ID
Reactor Building Closed Loop Cooling System	NA	VA
Pipe Supports	P	VA
High Pressure Coolant Injection Pumps	P	BJ
Instrument Air System	NA	LD
Control Room Habitability System	NA	VI