

# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9704290004 DOC.DATE: 97/04/17 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.  
RADEMACHER,N.L. Niagara Mohawk Power Corp.  
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-002-00:on 970313,shroud repair anomalies have been determined to be that assumptions used in design did not appropriately account for installation tolerance.Modified & installed new latches.W/970417 ltr.

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NIAGARA MOHAWK

GENERATION  
BUSINESS GROUP

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

April 17, 1997  
NMP1L 1204

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

RE: LER 97-02  
Docket No. 50-220

Gentlemen:

In accordance with 10CFR50.73 (a)(2)(ii), we are submitting LER 97-02, "Shroud Repair Anomalies."

Very truly yours,

Norman L. Rademacher  
Plant Manager - NMP1

NLR/GJG/lmc  
Enclosure

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

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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-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20535, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1) Nine Mile Point Unit 1	DOCKET NUMBER (2) 5 0 0 0 2 2 0	PAGE (3) 1 OF 4
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TITLE (4)  
Shroud Repair Anomalies

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)	
03	13	97	97	002	00				N/A	0 5 0 0 0	
									N/A	0 5 0 0 0	

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) 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(e)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> OTHER
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<i>(Specify in Abstract below and in Text, NRC Form 366A)</i>
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME W. R. Yaeger - Engineering Manager NMP1	TELEPHONE NUMBER (315) 349-7834
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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 DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO			

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

On March 18, 1997, it was determined that one Core Shroud Repair Assembly was degraded. Subsequent inspections revealed that each Core Shroud Assembly had experienced some degradation.

The cause of the degradation has been determined to be that assumptions used in the design did not appropriately account for installation tolerance and the potential for tie rod subcomponent damage due to this unanticipated movement.

NMPC intends to modify and reinstall the Core Shroud Stabilizer Assembly, and to perform a re-inspection coincident with the core shroud vertical weld re-inspection schedule. NRC approval of the repair assembly modification is required prior to unit restart.



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**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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Nine Mile Point Unit 1	05000220	97	- 02	- 00	02 OF 04	

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

**I. DESCRIPTION OF EVENT**

The Nine Mile Point Unit 1 (NMP1) core shroud has four General Electric (GE) Core Shroud Stabilizer Assemblies installed. These assemblies were installed during the RFO-13 (1995) refueling outage, in accordance with our letters dated January 6, 1995 and January 23, 1995. The installation was done as a pre-emptive repair of the core shroud horizontal welds H1 through H7 in lieu of performing baseline shroud inspection of these horizontal welds. Inherent to the stabilizer design was the assumption that the lower tie rod support latches remain intact and that the tie rods retain installed pre-loads. The NRC approved this alternative repair by letter dated March 31, 1995.

In accordance with our letter of October 14, 1995, NMPC has performed inspection of the Core Shroud Stabilizer Assemblies. During inspections commencing on March 18, 1997, it was identified that each of the tie rod assemblies had lost some vertical thermal preload and three of the lower spring wedge latches were damaged. A detailed description of the results of our inspection are contained in Enclosure 2 of the April 8, 1997 letter from M. J. McCormick to the NRC on Generic Letter 94-03, "Intergranular Stress Corrosion Cracking (IGSCC) in Boiling Water Reactors."

**II. CAUSE OF EVENT**

The as found condition shows that both the latch failure and the tie rod looseness were related. The root cause of the tie-rod nonconformances is incorrect design assumptions. Specifically, an incorrect assumption was made regarding the ability for the lower support wedge contact point to slide along the Reactor Pressure Vessel (RPV) wall. The inability to accommodate such differential motion at the contact point lead to greater than designed induced stresses in the latches, which were not anticipated to experience loading. These high stresses were likely to have caused latch failure through Stress Corrosion Cracking.

Differential motion at the contact point was anticipated because differential thermal expansion between the RPV and the tie rod occurs during RPV heatup and cooldown. However, additional stress was placed on the latches due to the unanticipated differential motion caused by installation tolerances between the tie rod lower support toggle bolts and the toggle bolt holes in the shroud support cone. These tolerances allowed the lower support to move up the inclined shroud support cone allowing vertical displacement of the stabilizers due to thermal loading and associated stress on the latches.

A more detailed discussion of the root cause of the Core Shroud Stabilizer Assembly anomalies is contained in Enclosure 2 of the April 8, 1997 letter from M. J. McCormick to the NRC.





FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (7)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Nine Mile Point Unit 1	05000220	97	- 02	- 00		03 OF 04

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 results in the nuclear power plant being in a condition that was outside the design basis of the plant." The reportable condition is a discrepancy in the as found condition of the installed Core Shroud Stabilizer Assembly as described in our submittal and the approved NRC Safety Evaluation Report.

Enclosure 2, Section 4.0, of the April 8, 1997 letter from M. J. McCormick to the NRC contains the evaluation of consequences on previous plant operation. NMPC performed a conservative evaluation assuming each of the four lower springs were ineffective in providing lateral restraint. The remaining tie rod thermal preload was also used. All plant operating design cases were evaluated. It was determined that all stresses were within ASME Code limits, core cooling operability was unaffected, and safe shutdown capability was unaffected. Based upon that evaluation, NMPC has concluded that operation during the previous fuel cycle, with the degraded shroud repair assemblies, did not result in operation of the plant in an unsafe manner.

**IV. CORRECTIVE ACTIONS**

1. NMPC has analyzed the cause of the latch failure and provided a detailed report in a letter dated April 8, 1997, from M. J. McCormick to the NRC.
2. NMPC modified and installed new latches which are more tolerant of differential vertical displacement. NRC approval of this modification is required prior to start up.
3. The lower support assemblies were repositioned to remove the clearance between the toggle bolts and the shroud side of the shroud support cone holes and the tie rod assemblies were re-torqued to ensure the assemblies remain tight during future plant operation.

**Preventive Actions**

1. NMPC will re-inspect the Core Shroud Stabilizer Assembly coincident with the core shroud vertical weld re-inspection schedule, which will be agreed upon with the NRC as a result of our 10CFR50.55a submittal dated April 8, 1997.
2. NMPC will revise Nuclear Engineering Procedure NEP-DES-07 to require: 1) that safety significant reactor internals modification designs be reviewed by an independent third party reviewer; and 2) that first of a kind designs that cannot be post-modification tested prior to operations acceptance shall require an independent third party review. Procedure will be revised by June 30, 1997.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1)  Nine Mile Point Unit 1	DOCKET NUMBER (2)  05000220	LER NUMBER (6)				PAGE (3)  04 OF 04
		YEAR 97	SEQUENTIAL NUMBER 02	REVISION NUMBER 00		

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

V. **ADDITIONAL INFORMATION**

- A: Failed components: Lower wedge latch on Core Shroud Stabilizer Assembly at the 90 degree location.
- B. Previous similar events: LER 96-02, "Core Shroud Repair Stabilizer Assembly Different Than 10CFR50.55(a) Design Description to Installation/Inspection/Engineering Personnel Error." The event described in this report is that the shroud repair stabilizer assembly lower spring on the stabilizer at azimuth 270 degrees did not have the surface area contact as described in the NRC SER.
- C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 EIS FUNCTION	IEEE 805 SYSTEM ID
Core Shroud	NA	MD

