CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9612090245 DOC.DATE: 96/12/02 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 96-010-00:on 961101,Appendix R fire induced hot shorts in shutdown cooling valves occurred.Caused by fire induced control circuit hot shorts could result in mechanical damage to MOVs.MOVs included in SSA were reviewed.W/961202 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-1 PD	1	1	HOOD,D	1	1
INTERNAL:	ACRS	1	1	AEOD/SPD/RAB	2	2
	AEOD/SPD/RRAB	2	2	FILE CENTER	1	1
	NRR/DE/ECGB	1	1	NRR/DE/EELB	1	1
	NRR/DE/EMEB	1	1	NRR/DRCH/HHFB	1	1
	NRR/DRCH/HICB	1	1	NRR/DRCH/HOLB	1	1
	NRR/DRCH/HQMB	1	1	NRR/DRPM/PECB	1	1
	NRR/DSSA/SPLB	1	1	NRR/DSSA/SRXB	1	1
	RES/DET/EIB	1	1	RGN1 FILE 01	1	1
EXTERNAL:	L ST LOBBY WARD	1	1	LITCO BRYCE,J H	1	1
	NOAC MURPHY,G.A	1	1	NOAC POORE,W.	1	1
	NRC PDR	1	1	NUDOCS FULL TXT	1	1

CATEGORY 1 DOCUMENT

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM OWFN 5D-5(EXT. 415-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

FULL TEXT CONVERSION REQUIRED
TOTAL NUMBER OF COPIES REQUIRED: LTTR 26 ENCL 26

NIAGARA MOHAWK
GENERATION
BUSINESS GROUP

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

December 2, 1996
NMP1L 1163

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

RE: LER 96-10
Docket No. 50-220

Gentlemen:

In accordance with 10 CFR 50.73(a)(2)(ii)(B), we are submitting LER 96-10, "Appendix R Fire Induced Hot Shorts in Shutdown Cooling Valves."

Very truly yours,

Norman L. Rademacher
Plant Manager - NMP1

NLR/GJG/kap
Enclosure

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

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 4

TITLE (4)
Appendix R Fire Induced Hot Shorts In Shutdown Cooling Valves

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)
11	01	96	96		010		00	12	02	96	N/A	05000
											N/A	05000

OPERATING MODE (9): 1

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(a)(1)(i)
- ☐ 20.405(a)(1)(ii)
- ☐ 20.405(a)(1)(iii)
- ☐ 20.405(a)(1)(iv)
- ☐ 20.405(a)(1)(v)
- ☐ 20.405(c)
- ☐ 50.36(c)(1)
- ☐ 50.36(c)(2)
- ☐ 50.73(a)(2)(i)
- ☒ 50.73(a)(2)(ii)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)
- ☐ 50.73(a)(2)(v)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(b)
- ☐ 73.71(c)
- ☐ OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
William 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		03	03	97

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

On November 1, 1996, at 1605 hours, with Nine Mile Point Unit 1 (NMP1) in the "RUN" mode and reactor thermal power at approximately 100 percent, NMP1 management determined that a potential fire induced hot short in the control circuits of two shutdown cooling (SDC) system inside containment isolation valves (IV38-01 and IV38-13) could have rendered the valves unable to perform their intended Appendix R cold shutdown functions. This condition existed for the period from March 3, 1983 to April 12, 1995.

A postulated hot short, as described in Information Notice 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," effectively bypasses a motor-operated valve (MOV) torque and control switches, causing spurious operation. The identified condition postulates valve closure, resulting in potential valve mechanical damage prior to the removal of power by motor thermal overload relays. This was not previously evaluated due to a failure to recognize that valve actuator stall thrust could result in mechanical damage to the MOVs. The cause of this oversight is being evaluated further, and will be reported in a supplement to this LER.

The corrective action was to administratively lock the MOV breakers open, to preclude spurious operation of the valves, and consequential mechanical failure. Additional corrective actions will be described in the supplement to this Licensee Event Report after the root cause evaluation is completed. The Updated Final Safety Analysis Report (UFSAR), Section 10, Appendix 10B, the Appendix R Safe Shutdown Analysis (SSA) will be revised to require the valve breakers be locked open for Appendix R, in addition to Amendment No. 154.

I. DESCRIPTION OF EVENT

On November 1, 1996, at 1605 hours, with Nine Mile Point Unit 1 (NMP1) in the "RUN" mode and reactor thermal power at approximately 100 percent, NMP1 management determined that a potential fire induced hot short in the control circuits of two shutdown cooling (SDC) system inside containment isolation valves (IV38-01 and IV38-13) could have rendered the valves unable to perform their intended Appendix R cold shutdown functions. This condition existed for the period from March 3, 1983 to April 12, 1995.

NRC Information Notice 92-18 (Potential for Loss of Remote Shutdown Capability During a Control Room Fire) alerts licensees of conditions found at several reactors that could result in a loss of capability to maintain the reactor in a safe shutdown condition in the unlikely event that a control room fire forced reactor operators to evacuate the control room. The information notice gives examples of two plants where hot shorts could have been postulated, in the absence of thermal overload protection, which would have caused valve damage before the operator shifted control of the valves to the remote/alternate shutdown panels at those facilities. The information notice provides information with regard to the design which would preclude these type of malfunctions. Niagara Mohawk's initial evaluation of NRC Information Notice 92-18 excluded the evaluation of shutdown cooling valves IV38-01 and IV38-13 since those valves are provided with thermal overload protection.

However, during our review of Generic Letter 89-10, Niagara Mohawk also evaluated the mechanical impact of spurious operation of these valves even with thermal overload protection. Based upon our evaluation, Niagara Mohawk would anticipate potential inability to open these valves, if stalled closed, due to valve mechanical damage occurring prior to overload relay trips. The assessment shows that the yield strength of the valve stems would probably be exceeded if subjected to stall thrust.

II. CAUSE OF EVENT

The apparent cause of this deficiency was a failure to recognize that valve actuator stall thrust caused by fire induced control circuit hot shorts could result in mechanical damage to the motor operated valves. The Appendix R safe shutdown analysis we performed did evaluate and resolve hot short vulnerability and spurious operation to those valves credited for safe shutdown functions. However, as part of the safe shutdown analysis, mechanical valve damage was not assumed as the focus was on addressing inadvertent operation. The deficiency is only now evident by the application of the current day analysis methodology that has evolved in the industry as developed for the Generic Letter 89-10 program.

A root cause evaluation will be performed by February 1, 1997, to determine the reason why the potential valve damage effects were not addressed by the original safe shutdown analysis. A supplement to this LER will be submitted by March 3, 1997.

III. ANALYSIS OF EVENT

This condition is reportable in accordance with 10CFR50.73(a)(2)(ii), "any event or condition that resulted in a condition of the nuclear power plant, including its principle safety barriers, being seriously degraded, or that resulted in the nuclear plant being: (b) in a condition that was outside the design basis of the plant."

The original safe shutdown analysis had anticipated hot short vulnerability to these control circuits, and Damage Repair Procedure (DRP) N1-DRP-GEN-004, as entered by Special Operating Procedure N1-SOP-9.1, "Control Room Evacuation," directs valve opening by operation at the motor control center (MCC). The DRP lifts each control circuit lead to the control complex and jumpers the control circuit at the MCC from the torque switch to the contactor. This action effectively isolates the control complex control circuit damage, thereby precluding valve misoperation and consequential damage. The safe shutdown analysis, however, did not anticipate the impact of spurious operation on the mechanical capabilities of the valve.

The breakers to the isolation valves are currently administratively controlled locked open in accordance with license Amendment No. 154 and associated modifications for single failure concerns related to maintaining the shutdown cooling Appendix J water seal. Maintaining de-energization of the valves was not invoked by the safe shutdown analysis, as would be required by Appendix R, for anticipated fire damage effects which would challenge initial equipment shutdown option creditation. This condition existed for the period from March 3, 1983, (date of the NRC approval of the Nine Mile Point Unit 1 Appendix R program), to April 12, 1995, (the date of implementation of Technical Specification Amendment No. 154).

In an unlikely event of a control room fire and coincident hot short, it is anticipated that the SDC valves 38-01 and 38-13 could have had stall thrust applied and thus prevented them from remote reopening. The consequence of this would be that the SDC system would not be available to achieve cold shutdown. However, potential alternative means to achieve cold shutdown exist which would have been used albeit not credited in the Appendix R SSA. In addition, it is postulated that SDC could have been restored by de-inerting the containment and manually opening IV 38-01 and IV 38-13, in less than 72 hours.

During the period in which this condition existed, the reactor could have been shutdown and maintained in a safe condition in the event of a fire. There were no adverse safety consequences as a result of this condition. There were no adverse consequences to the health and safety of the general public or plant personnel as a result of this condition.

IV. CORRECTIVE ACTIONS

1. Corrective action measures will be to revise the Updated Final Safety Analysis Report (UFSAR), Section 10, Appendix 10B, the Appendix R safe shutdown analysis, to require that the valve breakers be locked open to preclude spurious operation by May 30, 1997. These breakers are currently locked open in conformance with Technical Specification Amendment 154.

2. Those motor-operated valves (MOVs) included in the SSA for safe shutdown function were reviewed for susceptibility to the IN 92-18 described hot short for their respective fire areas. All were found to be acceptable in either precluding spurious operations, or were presumed lost for the fire area and alternate shutdown means established.

3. A root cause evaluation will be performed by February 1, 1997, to determine the reason why the potential valve damage effects were not addressed by the original safe shutdown analysis. A supplement to this LER will be submitted by March 3, 1997.

V. ADDITIONAL INFORMATION

A. Failed components: none.

B. Previous similar events: LER 89-15, Revision 2, "Emergency Diesel Failure Modes Not Identified During Appendix "R" Review." One of the corrective actions for LER 89-15 concluded that fire protection engineering had reevaluated the necessity of completing a detailed FMEA for other "cold shutdown" systems as part of NMPC's future Appendix R program needs, on a case-by-case basis and has not identified a need to complete FMEA's for any other systems. (The EDGs are the one "cold shutdown" system considered complex enough to require a FEMA). This corrective action was completed prior to the IN 92-18 evaluation. However, NMPC had previously considered spurious actuation of IV 38-01 and IV 38-13 as a credible failure mode and had in place DRPs to respond to the issue. Based upon our ongoing program for GL 89-10, NMPC has now realized that in addition to controlling spurious actuations, the impacts of initial spurious actuation on the mechanical capability of the valves must be considered.

C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 FUNCTION	IEEE 805 SYSTEM ID
IV38-01	ISV	N/A
IV38-13	ISV	N/A