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FACIL:50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
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SUBJECT: LER 87-076-00:on 871212,potential radioactive release resulting from design deficiency in floor drain sys.

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NRC Form 366
9-83

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8 31 88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Nine Mile Point Unit 2	0 5 0 0 0 410	1 OF 06

TITLE (4)

Potential Radioactive Release Resulting From A Design Deficiency In The Floor Drain System

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)
											N/A	0 5 0 0 0
12	12	87	87	—	076	—	00	01	11	88	N/A	0 5 0 0 0

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	000	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 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	
	AREA CODE	
Robert E. Jenkins, Assistant Supervisor Technical Support	315	349-4220

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
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On December 12, 1987 during a 10CFR21 (F87-014) review, it was discovered that the drain lines from the control room charcoal filter train cubicles, the main steam tunnel, and the auxiliary service building joined together in the auxiliary service building and continued into the reactor building and terminated in the reactor building floor drain sump. Specifically, there was an air communication path between the control room pressure boundary, the main steam tunnel, and secondary containment through the equipment and floor drain piping. This particular design posed a threat to plant personnel and equipment safety in the event of a high energy line break or a feedwater line break accident in the Main Steam tunnel. At the time of discovery the reactor was in cold shutdown with the reactor mode switch in the "Shutdown" position.

The cause of this event was a design deficiency.

Corrective actions for this event included the incorporation of numerous modifications into the Nine Mile Point Unit 2 plant design to eliminate the potential problem that existed due to the intercommunicating drain lines.

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1/1

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 410	87	— 076	— 00	02 OF 06

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

I. DESCRIPTION OF EVENT

On December 12, 1987 during a 10CFR21 (F87-014) review, it was discovered that the drain lines from the control room charcoal filter train cubicles, the main steam tunnel, and the auxiliary service building joined together in the auxiliary service building and continued into the reactor building and terminated in the reactor building floor drain sump (Figure 1). Specifically, there was an air communication path between the control room pressure boundary, the main steam tunnel, and secondary containment through the equipment and floor drain piping. This particular design posed a threat to plant personnel and equipment safety in the event of a high energy line break or a feedwater line break accident in the Main Steam tunnel. At the time of discovery the reactor was in cold shutdown with the reactor mode switch in the "Shutdown" position.

There were no components or systems which were inoperable and/or out of service which contributed to the event. No plant system or component failures resulted from the event.

II. CAUSE OF EVENT

The root cause of this event was a design deficiency. This deficient design allowed the intercommunicating drain lines to be installed without the consideration of a design basis accident occurring such as a high energy line break or a feedwater line break accident in the steam tunnel.

III. ANALYSIS OF EVENT

There were no adverse safety consequences at the time of discovery since the reactor was in cold shutdown and the reactor mode switch was in the "SHUTDOWN" position. However, Nine Mile Point Unit 2, before this discovery, has operated up to 65% power. These deficient drain lines had the potential to become a serious problem had a high energy line break or a feedwater line break accident occurred in the main steam tunnel. The following is a summary of each:

HIGH ENERGY LINE BREAK ACCIDENT

If a high energy line break accident occurred (Section 15.6.4 of the FSAR), significant amounts of water/steam and radioactive material would have been funneled into various areas through the intercommunicating drain lines. This steam and radioactive material would have been funneled into the electrical tunnel HVAC room, the Carbon Dioxide tank room, the Auxiliary Service building and the Control Room filter train cubicles. Many of these areas contain safety-related equipment, and consequently an event of this type could cause degradation to equipment needed to achieve and maintain a safe shutdown.

A significant concern is the steam and radioactive material entering the control room emergency filtration system. This system is designed to maintain habitability of the Control Room for Operations personnel during and following all design basis accident conditions. Any steam release into the filter train will introduce moisture to the charcoal adsorber. It is expected that this condition will reduce the filtering adsorption efficiency of the charcoal adsorber and render the control room emergency filtration system inoperable. Therefore, this condition would result in the control room being uninhabitable by Operations personnel.

FEEDWATER LINE BREAK ACCIDENT

The feedwater line break accident outside the primary containment is analyzed in Section 15.6.6 of the FSAR. If a feedwater line break accident occurred, the main steam tunnel would become flooded to about 14 feet (Elevation 254'). This water would be funneled into the lower elevation areas via the equipment and drain system and result in flooding of the reactor building and the electrical tunnel HVAC room. Flooding would not occur in the control room filter train cubicles or the Carbon Dioxide tank room since the open drain lines are above the flood level in the steam tunnel.

Flooding of the reactor building would result in approximately 24 inches of water on the floor (Elevation 175'). Although the sump pumps are actuated to remove excess water in the sump, the capacity of the two pumps (100 gallons per minute total) are not sufficient to prevent the sump from overfilling and flooding the building. The resulting flood level in the reactor building, approximately 24 inches above the floor level, results in water submergence of redundant safety-related instruments necessary for safe shutdown.

The resulting flood level in the electrical tunnel HVAC room is estimated to be 17 feet above the floor at Elevation 237'. Since the unit coolers for the electrical tunnel are located at the floor level, flooding above the floor level would result in damage to the safety-related unit coolers for the electrical tunnel. With the loss of the HVAC for the electrical tunnel (a safety-related function as discussed in Section 3.11.4 of the FSAR), this results in an unacceptable environmental condition in the electrical tunnel necessary for maintaining a plant safe shutdown condition.

IV. CORRECTIVE ACTION

An immediate corrective action was for NMP2's Licensing Department to write a 10CFR21 report and to initiate numerous modifications to eliminate the problems that existed with the drain lines. These modifications are as follows:

1. Modification No. PN2Y87MX244 - This modification isolated the control building filter drain line from all areas of the plant, thereby protecting the control room pressure boundary from any backflow of air through these lines. Modification completed 12/18/87.

2. Modification No PN2Y87MX247 - This modification eliminated all the drain lines from the CO_2 tank room and the electrical tunnel HVAC room that connected with the main steam tunnel, by cutting and capping these lines. Modification completed 12/18/87.

3. Modification No. PN2Y87MX258 - This modification provided manual shutoff valves in the main header so that the drain from the steam tunnel could be isolated, if required. In addition, this modification also reduced the diameter of a portion of vertical drain line in order to cut down the flow into the Reactor Building. Modification completed 12/20/87.

In addition, per the 10CFR21 review other equipment and floor drain systems were reviewed for similar deficiencies. Corrective actions based on this review are as follows:

1. Modification No. PN2Y87MX261 - This modification provided a loop seal on the 6 inch drain header in each Reactor Building auxiliary bay such that all floor and equipment drains in Elevation 240' would be isolated from the lower elevations of the auxiliary bays and secondary containment. Modification completed 12/19/87.

2. Modification No. PN2Y87MX263 - This modification installed loop seals in the filter drains of the Standby Gas Treatment System. Modification completed 12/19/87.

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

V. ADDITIONAL INFORMATION

Identification of Components Referred to in this LER

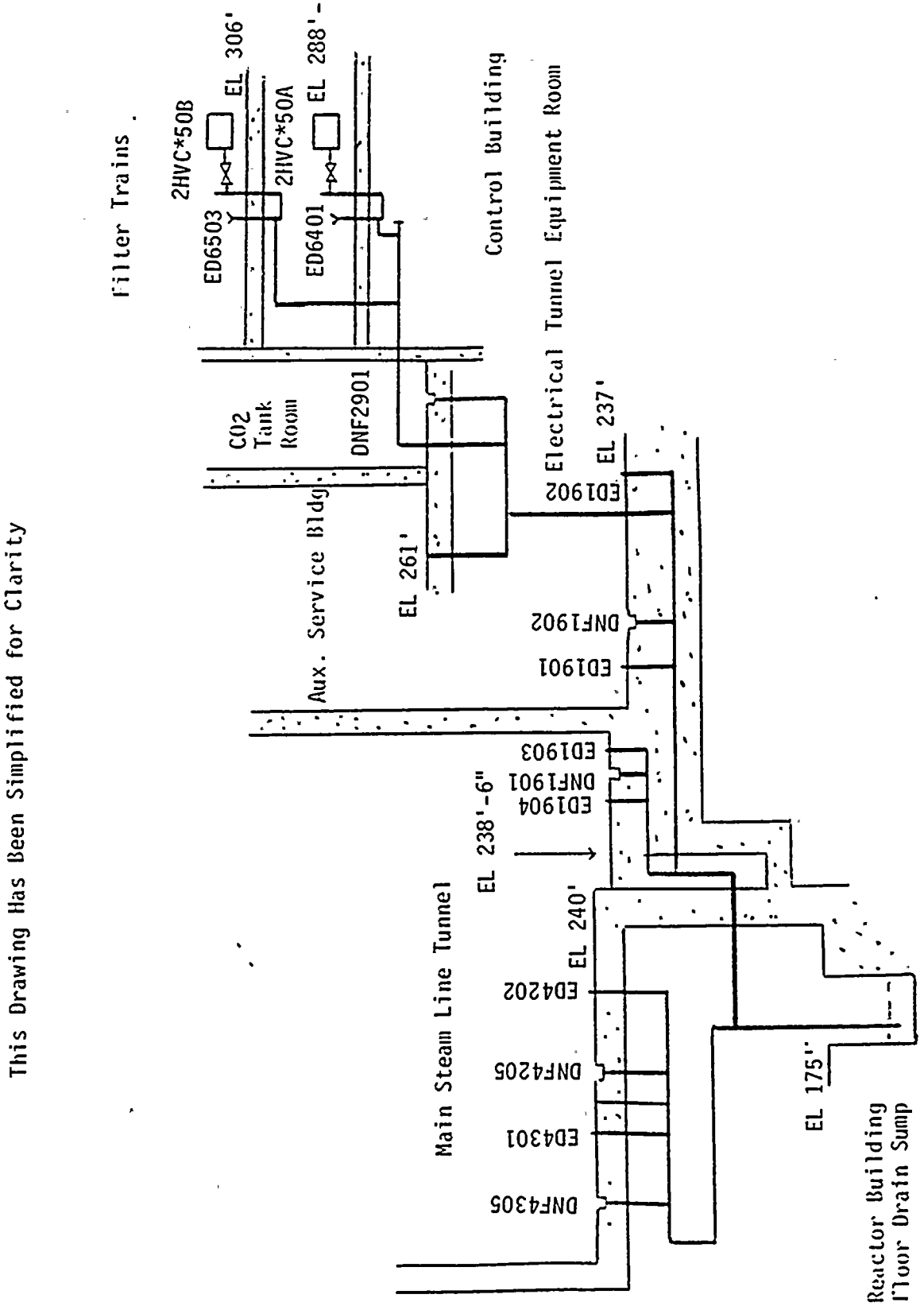
Component	IEEE 803 EIIS Funct	IEEE 805 System ID
Control Building	N/A	N/A
Main Steam Tunnel	N/A	NG
Auxiliary Building	N/A	NF
Reactor Building	N/A	NG
Carbon Dioxide Tank Room	N/A	LW
Electrical Tunnel	N/A	FA
Standby Gas Treatment Room	N/A	BH
Charcoal Filter Train	FLT	VI
Floor Drain	DRN	N/A
Floor Drain Sump	P	N/A
Gate Valve	V	N/A
Standby Gas Treatment Filters	FLT	BH

There has been no previous similar events.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Nine Mile Point Unit 2	0 5 0 0 0 410	87	— 076	— 00	06 OF 06

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

FIGURE 1



NMP29840

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

January 11, 1988

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Docket No. 50-410
LER 87-76

Gentlemen:

In accordance with 10 CFR 50.73, we hereby submit the following Licensee Event Report:

LER 87-76 Which is being submitted in accordance with 10 CFR 50.73 (a) (2) (v), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(A) Shutdown the reactor and maintain it in a safe shutdown condition;

(B) Remove residual heat;

(C) Control the release of radioactive material; or

(D) Mitigate the consequences of an accident."

A 10 CFR 50.72 (b) (2) (ii) report was made at 1033 hours on December 12, 1987.

This report was completed in the format designated in NUREG-1022, Supplement 2, dated September 1985.

Very truly yours,

Thomas E. Lempges

Thomas E. Lempges
Vice President
Nuclear Generation

c IE22 1/1

TEL/SCN/mjd

Attachments

cc: Regional Administrator, Region 1
Sr. Resident Inspector, W. A. Cook