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ACCESSION NBR: 8711130166 DOC. DATE: 87/11/10 NOTARIZED: NO DOCKET #
FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha 05000410
AUTH. NAME AUTHOR AFFILIATION
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RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-065-00: on 871015, secondary containment not maintained at uniform subatmosphere pressure. Caused by design deficiency. Mod to relocated differential pressure pressure elements initiated. W/871110 1tr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: 21 05000410

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	NRR/DREP/RAB	1	1	NRR/DREP/RPB	2	2
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	REG FILE 02	1	1	RES DEPY GI	1	1
	RES TELFORD, J	1	1	RES/DE/EIB	1	1
	RGN1 FILE 01	1	1			
EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
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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 05

TITLE (4) Quarter Inch Vacuum in Secondary Containment not Maintained due to 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)
									N/A	0 5 0 0 0
10	15	87	87	— 065 —	00	11	10	87	N/A	0 5 0 0 0

OPERATING MODE (9): 4

POWER LEVEL (10): 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check one or more of the following)* (11)

[ ] 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)	[X] 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)	Voluntary
[ ] 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	AREA CODE	TELEPHONE NUMBER
Robert G. Randall, Supervisor Technical Support	315	349-2445

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)

[ ] YES *(If yes complete EXPECTED SUBMISSION DATE)* [X] NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

On October 15, 1987 following a Niagara Mohawk Engineering Department evaluation, it was determined that the secondary containment (Reactor Building) for Nine Mile Point Unit 2 (NMP2) had not been maintained at a uniform subatmospheric pressure of 0.25 inch of vacuum water gauge. At the time of this determination, the plant was in a cold shutdown condition with the reactor mode switch in the "SHUTDOWN" position. Reactor pressure and coolant temperature were approximately atmospheric and 132°F, respectively.

The root cause of this event was a design deficiency. The system to measure differential pressure did not account for the difference in the pressure gradients inside and outside the reactor building. These differing pressure gradients resulted from the difference in temperature between inside and outside the reactor building.

Corrective actions have been to temporarily revise the differential pressure transmitters' setpoints to account for the differences in the pressure gradients. A modification has been initiated to relocate the differential pressure elements to the roof of the reactor building, thus removing the effect of the differing pressure gradients on the sensed differential pressure.

This event has been determined to not be reportable per 10CFR21, "Reporting of Defects and Noncompliance", nor 10CFR50.73, "Licensee Event Report System", but is being submitted as a voluntary LER.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

I. DESCRIPTION OF EVENT

On October 15, 1987 following a Niagara Mohawk Engineering Department evaluation, it was determined that the secondary containment (Reactor Building) for Nine Mile Point Unit 2 (NMP2) had not been maintained at a uniform subatmospheric pressure of 0.25 inch of vacuum water gauge, as stated in the NMP2 Final Safety Analysis Report (FSAR). At the time of this determination, the plant was in a cold shutdown condition with the reactor mode switch in the "SHUTDOWN" position. Reactor pressure and coolant temperature were approximately atmospheric and 132°F, respectively.

Although the FSAR states that a uniform subatmospheric pressure shall be maintained, due to the effect of elevation on pressure, this is not possible. The effect of elevation on pressure is even greater when dealing with cold ambient conditions.

When the temperature outside is lower than the temperature inside the reactor building, the air outside is more dense than the air inside the reactor building. Since the colder air on the outside is more dense, it exerts more of a force per increment of elevation. Therefore, as one moves up from elevation 265, the pressure decrease is more rapid outside the reactor building than inside the reactor building. This difference in the pressure decrease for inside and outside the reactor building can be substantial. A differential pressure of 0.25 inch of vacuum water gauge measured at elevation 265, with reactor building interior and exterior temperatures of 85°F and 0°F, respectively, results in a positive 0.06 inch water gauge differential pressure at the uppermost elevation of the reactor building.

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

II. CAUSE OF EVENT

The root cause of this event was a design deficiency. The design of the system to measure differential pressure between the interior of the reactor building and the atmosphere did not account for the difference in the pressure gradients inside and outside the reactor building. These differing pressure gradients resulted from the difference in temperature between inside and outside the reactor building.

With the reactor building interior maintained at 85°F, whenever the outside temperature is below 85°F the external air is denser than the air inside the reactor building. Therefore, as one increases in elevation from elevation 265, where the differential pressure is measured, the pressure decrease outside the reactor building is more than the pressure decrease inside the reactor building. Under these conditions, with no compensation for the differing pressure gradients, the upper elevations of the reactor building were maintained at less than 0.25 inch of vacuum water gauge with respect to the atmosphere.

*U.S GPO:1986-0-624-538/455

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III. ANALYSIS OF EVENT

Operation of the plant while in this condition would not have resulted in any significant safety hazard or increase in the consequences of an accident. NMP2 has remained within its Technical Specifications for operation of the plant.

Maintaining the reactor building at a uniform subatmospheric pressure of 0.25 inch of vacuum water gauge is a commitment in the NMP2 FSAR. However, the analysis of the radiological consequences of a LOCA inside primary containment presented in Sections 6.2.3 and 15.6.5 of the Nine Mile Point Unit 2 FSAR is a very conservative analysis. It follows the methods/assumptions and conditions of Nuclear Regulatory Commission Standard Review Plan (SRP) 15.6.5 (NUREG-800), and Regulatory Guides 1.3 and 1.7. The most restrictive assumption in the analysis is that 100% core noble gas inventory and 25% core halogen inventory are released to the drywell and 50% core halogens are immediately released to the suppression pool. This assumes massive fuel damage. However, this is a very conservative assumption in that the Emergency Core Cooling Systems (ECCS) are designed to actuate in sufficient time, even in the event of the worst single failure, to prevent the maximum fuel cladding temperature from exceeding 2200°F, limit local oxidation of the fuel cladding to 17% of the total cladding thickness before oxidation, limit total hydrogen generated to 1% of the total hypothetical amount which could be generated, maintain the core in a geometry amenable to cooling and maintain the core temperature acceptably low by decay heat removal. Compliance with these requirements assures there would be no significant fission product release to the containment.

Therefore, using a realistic but still conservative analysis of the LOCA accident, offsite doses would remain less than the 10CFR100 guidelines and no significant safety hazard existed.

The Technical Specification surveillance requirement for demonstrating the secondary containment integrity is maintained states in part, "SECONDARY CONTAINMENT INTEGRITY shall be demonstrated by: a. Verifying at least once per 24 hours that the pressure within the secondary containment is greater than or equal to 0.25 inch of vacuum water gauge." Per the approved procedure, the secondary containment differential pressure was verified as being maintained at least once per 24 hours when secondary containment integrity was required. Verifying the differential pressure requirement was being maintained was in accordance with the BASES of the secondary containment technical specification and in accordance with 10CFR50 Appendix A, General Design Criteria. The BASES for secondary containment states, "Secondary containment is designed to minimize any ground level release of radioactive material which may result from an accident." 10CFR50 Appendix A, General Design Criteria, specifically Criteria 16, "Containment Design", requires, "an essentially leak-tight containment". Having maintained the majority of the reactor building at some negative differential pressure would minimize any ground level release.

This condition of a reduced differential pressure as stated in the FSAR has existed since October 31, 1986, when NMP2 received its operating license. It should be noted that, although a minimum of 0.25 inch of vacuum water gauge was not maintained, secondary containment was maintained at a subatmospheric pressure, except on extremely cold days this past winter. Secondary containment integrity is required only while in Operational Conditions 1 (RUN), 2 (STARTUP), 3 (HOT SHUTDOWN) and *(When irradiated fuel is being handled in the reactor building and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel). With fuel loading completed in November 1986 and no entry into Operational Conditions 1, 2 or 3 until May 1987, secondary containment was required during this time only while in Operational Condition *. While it has not been established if and/or when NMP2 was in Operational Condition * during this time, it is felt that these times coincident with the extremely cold days were of short duration and presented no significant safety hazard.

This event has been determined to not be reportable per 10CFR21, "Reporting of Defects and Noncompliance", nor 10CFR50.73, "Licensee Event Report System", but is being submitted as a voluntary LER.

IV. CORRECTIVE ACTIONS

Immediate corrective action was not required at the time of the determination, since the plant was in cold shutdown, with no requirement to have secondary containment integrity.

To maintain a minimum differential pressure of 0.25 inch of vacuum water gauge for all areas in the reactor building, prior to plant restart, the setpoint on the differential pressure transmitters were reset, from 0.33 to 0.76 inch of vacuum water gauge. Analysis has shown resetting the transmitters' setpoints to 0.76 inch of vacuum water gauge assures the differential pressure at upper elevations in the reactor building will be at least 0.25 inch of vacuum water gauge, with interior and exterior reactor building temperatures ranging from 85°F to 0°F, respectively.

A modification has been initiated to relocate the differential pressure elements to the roof of the reactor building. By relocating the pressure elements, the effect of the differing pressure gradients on the sensed differential pressure is removed and the differential pressure setpoints may be reset to the original value of 0.33 inch of vacuum water gauge. With implementation of this modification, a large pressure differential in the lower elevations of the reactor building will exist only on days of significant differences between the reactor building interior and exterior air temperatures. This modification (PN2Y87MX229) is currently scheduled to begin on November 23, 1987.

With the implementation of this modification, a minimum, not uniform, differential pressure of 0.25 inch of vacuum water gauge will be established in the reactor building. The FSAR statement of a uniform pressure cannot be met. Therefore, the FSAR will be reviewed and ammended to make the FSAR and Technical Specifications consistent.

NRC Form 366A (9-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
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V. ADDITIONAL INFORMATION

Identification of Components Referred to in this LER

Component	IEEE 803 EIIS Funct	IEEE 805 System ID
Emergency Standby Gas Treatment System	N/A	BH
Reactor Building Ventilation System	N/A	VA
Differential Pressure Indicator	PDI	BH
Pressure Transmitter	PT	BH
Differential Pressure Transmitters	PDT	BH

There have been no previous similar events at NMP2.

NMP26483

NIAGARA MOHAWK POWER CORPORATION

NIAGARA MOHAWK

301 PLAINFIELD ROAD
SYRACUSE, NY 13212

THOMAS E. LEMPGES
VICE PRESIDENT—NUCLEAR GENERATION

November 10, 1987

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

RE: Docket No. 50-410
LER 87-65

Gentlemen:

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

LER 87-65

A 10 CFR 50.72 report was made at 1647 hours on October 15, 1987.

This report was completed in the format designated in NUREG-1022, Supplement No. 2, dated September 1985.

Very truly yours,

Thomas E. Lempges

Thomas E. Lempges
Vice President
Nuclear Generation

TEL/JTD/mjd

Attachments

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

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