CATEGORY 1

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FACIL:50-220 Nine Mile Point Nuclear Station, Unit 1, Niagara Powe 05000220
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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-007-00:on 970815,discovered that CREV sys had potential to perform outside design basis.Caused by inadequate evaluation of interface between Smoke Purge Sys & CREV sys.Revised CREV sys testing procedures.W/970915 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

September 15, 1997
NMP1L 1250

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

RE: Docket No. 50-220
LER 97-07

Gentlemen:

In accordance with 10CFR50.73(a)(2)(ii) and 10CFR50.73(a)(2)(v), we are submitting LER 97-07, "Potential Control Room Emergency Ventilation System Operation Outside the Design Basis due to Inadequate Evaluation."

Very truly yours,

Richard B. Abbott

Richard B. Abbott
Plant Manager - NMP1

RBA/TWP/lmc
Enclosure

IE22

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

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

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

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

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Nine Mile Point Unit 1	05000220	1 OF 5

TITLE (4)
Potential Control Room Emergency Ventilation System Operation Outside the Design Basis due to Inadequate Evaluation

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)
08	15	97	97		007		00	09	15	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)	☐ 20.402(b)	☐ 20.405(c)	☐ 50.73(a)(2)(iv)	☐ 73.71(b)	
100	☐ 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	
	☐ 20.405(a)(1)(iii)	☐ 50.73(a)(2)(i)	☐ 50.73(a)(2)(viii)(A)	*(Specify in Abstract below and in Text, NRC Form 366A)*	
	☐ 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
R. G. Randall - Engineering Manager NMP1	(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)		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 August 15, 1997 at 1600 hours, the Nine Mile Point Unit 1 (NMP1) staff identified a reportable condition whereby the Control Room Emergency Ventilation (CREV) system would not have been able to perform its design function. Specifically, the Control Room Smoke Purge system has been operated at times when the CREV system was required to be operable. Per design, the Smoke Purge system does not have an automatic isolation feature. If the Smoke Purge system was in operation when an initiation of the CREV system occurred, the CREV system would not have been able to maintain the design requirements for Control Room habitability.

The root cause of the event is inadequate evaluation (on two occasions) of the interface between the Smoke Purge system and the CREV system. The Control Room Smoke Purge system was operated for reasons other than smoke removal from a fire and operation in this manner was not considered for impact on Technical Specification (TS) operability of the CREV system. The implementation of the modification process failed to identify these deficiencies both in 1980 and again in 1984.

The immediate corrective actions included placing administrative controls on the Smoke Purge system to limit its operation. The procedures controlling operation and testing of the system will be revised to restrict the operation of the system to its intended design function (smoke removal) and to ensure that the system is only tested when the CREV system is not required to be operable. In addition, selected modifications will be reviewed to determine if similar interface problems exist.

I. DESCRIPTION OF EVENT

On August 6, 1997, the Nine Mile Point Unit 1 (NMP1) staff identified a condition whereby the Control Room Emergency Ventilation (CREV) system would not have been able to perform its design function. Specifically, the Control Room Smoke Purge system has been operated at times when the CREV system was required to be operable. Per design, the Smoke Purge system does not have an automatic isolation feature. If the Smoke Purge system was in operation when an initiation of the CREV system occurred, the CREV system would not have been able to maintain the design requirements for Control Room habitability.

The Control Room Smoke Purge system was installed at NMP1 in 1980 as part of an upgrade of the plant's fire protection capabilities. The installation of this system followed the modification process in effect at that time. A safety evaluation was written and determined that an unreviewed safety question did not exist. In addition, the NRC issued a Safety Evaluation Report with Amendment 33 to Facility Operating License No. DPR-63 (NMP1) for these various modifications to the fire protection system/program. This Safety Evaluation Report and Amendment documented the acceptability of these changes and added a license condition to NMP1 relating to the completion of the changes. A review of the documents associated with this modification was conducted to determine whether there was consideration given for automatic isolation of the Smoke Purge system upon CREV system actuation. The need for automatic isolation was not discussed in these documents. Additionally, procedural controls were not considered and therefore not placed on the Smoke Purge system to ensure that it would be operated only for its design function (i.e., smoke removal) and if needed to be operated, to verify compliance with TS requirements for operability of the CREV system. It should be noted that in 1980, the CREV system was a manually initiated system. An opportunity to evaluate the interface between these systems was again missed in the modification that provided the automatic initiation feature of the CREV system in 1984. The basic functions of the Smoke Purge system to remove smoke and the CREV system to maintain a positive pressure and filter outside intake air remained unchanged.

The Smoke Purge system was designed to evacuate smoke during a Control Room or Auxiliary Control Room fire by providing a fresh air input and exhaust system. However, the system has been operated for other reasons such as bringing fresh air into the Control Room during non-fire situations or providing alternate ventilation when normal ventilation was not functioning. The operation of the system during these periods was generally not logged or trended. The potential impact of Smoke Purge system operation on the CREV system was not recognized. On August 15, 1997, the Operations Department concluded that they had operated the Smoke Purge system at times for reasons other than its intended design of smoke removal.

In addition, Technical Specification (TS) 3.4.5 provides the operability requirements and Action statements pertaining to the CREV system. If the CREV system is inoperable, continued reactor operation or refueling operations are permitted for up to seven days. The Smoke Purge system was operated at times without

I. DESCRIPTION OF EVENT (cont'd)

declaring the CREV system inoperable and entering the applicable TS Action statement. Surveillance tests (per the fire protection program) performed on the Smoke Purge system were typically less than six hours in duration.

However, since the Smoke Purge system was run for other reasons as well, and since system operation was generally not logged, NMP1 has been unable to determine whether or not the seven day TS Action statement was ever exceeded.

II. CAUSE OF EVENT

The root cause of the event is inadequate evaluation (on two occasions) of the interface between the Smoke Purge system and the CREV system. The Control Room Smoke Purge system was operated for reasons other than smoke removal from a fire and operation in this manner was not considered for impact on TS operability of the CREV system. The implementation of the modification process failed to identify these deficiencies both in 1980 and again in 1984.

III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73 (a)(2)(ii), "any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded; or that resulted in the nuclear power plant being: (B) in a condition that was outside the design basis of the plant," and 10CFR50.73 (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: (D) mitigate the consequences of an accident."

Under normal plant conditions, outside air enters the Control Room through a louvered intake after which it passes through a normal supply isolation damper, which is interlocked with an emergency ventilation inlet damper. The outside air is mixed with recirculated return air and is circulated through the Control Room. In order to prevent infiltration of potentially contaminated air, doors are weatherstripped and penetrations are sealed to maintain a positive pressure of approximately one-sixteenth of an inch of water.

In the event of outside air contamination and receipt of a high radiation signal, the normal supply dampers will automatically close and the emergency inlet dampers will open. The outside air then flows through one of the two full-capacity Control Room emergency ventilation fans. The air passes through a high-efficiency particulate filter and a heated activated charcoal filter unit and then re-enters the normal ductwork and is circulated by the normal ventilation fan.

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

III. ANALYSIS OF EVENT (cont'd)

The Smoke Purge system was designed to remove smoke from the Control Room in case of a fire and consists of two independent fans, isolation dampers and associated controls.

As described in UFSAR Appendix 10B, Section 5.4, an assumption of the Safe Shutdown Analysis is that a fire does not occur simultaneously or coincident with any other transient or abnormal condition except for a loss-of-offsite power (LOOP) and those conditions resulting directly from the effect of the fire. Thus, it is not necessary to postulate a fire that would require the use of the Smoke Purge system simultaneously with a radiological event that would cause initiation of the CREV system. However, since the Smoke Purge system was operated for reasons other than smoke removal from a fire, the impact of this operation must be evaluated.

As stated earlier, the Smoke Purge system was designed without automatic isolation features. Although the system would not have automatically isolated under high radiation conditions, it is reasonable to expect that Control Room operators would have recognized this condition. The isolation of normal Control Room ventilation and initiation of the CREV system, as well as any high radiation condition, would be readily evident based on audible and visual annunciators as well as numerous other indications of system lineup changes. As such, the indications of a condition which required initiation of the CREV system would have prompted manually securing the Smoke Purge system. The controls for the Smoke Purge system are located on a fire panel in the Control Room.

The limiting dose to Control Room personnel occurs as a result of the design basis accident (DBA) loss-of-coolant accident (LOCA). Control Room LOCA doses are based on a 30 day exposure to Control Room personnel. Any additional contamination that might be drawn into the Control Room as a result of Smoke Purge system operation could have caused this limit to be exceeded had no additional actions been taken. The numerous radiological surveys that would be taken after an accident could have readily identified any dose rates higher than expected or assumed in the Control Room. Alarm response procedures, emergency procedures, and the resources of the emergency response organization would have been available to help in identifying and mitigating any dose consequences. Therefore, the ability of Control Room personnel to respond to the accident was not impaired and there were no adverse consequences to their health and safety. There were no adverse consequences to the health and safety of the public at any time.

IV. CORRECTIVE ACTIONS

The immediate corrective actions included placing administrative controls on the Smoke Purge system to limit its operation to smoke removal following a fire. This was performed to limit the use of the Smoke Purge system to its design function only.

IV. CORRECTIVE ACTIONS (cont'd)

The procedures controlling operation and testing of the system will be revised to restrict the operation of the system to its intended design function (smoke removal) and to ensure that the system is only tested when the CREV system is not required to be operable. This action will be completed by December 5, 1997.

In addition, selected modifications performed in the 1980's time frame will be reviewed for any system interaction deficiencies. This action will be completed by March 15, 1998.

Since the early 1990s, Niagara Mohawk Power Corporation (NMPC) has made substantial improvements to our design control process. The design change process now incorporates a more rigorous UFSAR review. To ensure that design changes are properly evaluated, the design process requires an independent verification of design criteria and bases including system interaction considerations. The resulting design outputs are then assessed against the need to revise operating procedures, and revisions are verified complete prior to declaring the system operable. NMPC believes that these improvements are effective in preventing events of this nature.

V. ADDITIONAL INFORMATION

A. Failed components: none.

B. Previous similar events: none.

C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 EIIS FUNCTION	IEEE 805 SYSTEM ID
Control Room Emergency Ventilation system	N/A	VI