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 4 1 0	1 OF 0 4

TITLE (4)

Inoperable Fire Barriers

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
1 1	1 7	8 6	8 6	— 0 0 8	— 0 2	0 7	0 7	8 7	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)			
5		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0 0		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)	X 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 G. Randall, Supervisor Technical Support	3 1 5 3 4 9 - 2 4 4 5

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 November 17, 1986 with the reactor at 0% power and the mode switch in "REFUEL", operations at Nine Mile Point Unit 2 (NMP2) suspended control rod testing (single rod withdrawals). This decision was based on the uncertainty of secondary containment integrity due to the discovery of potential breaches in various safety related fire barriers without the exact number or locations of these breaches being known.

Upon concluding that none of the breached penetrations crossed secondary containment boundaries, control rod testing resumed. However, the breached fire barriers did constitute a violation of Technical Specification Section 3.7.8, "Fire Rated Assemblies".

Corrective Actions Taken

(1) Fire watch patrols have been established in the affected fire zones.

(2) All breaches possible were sealed per NMP2 Modification PN2Y86MX142.

(3) As a fire zone is brought into compliance with FSAR section 9A.3.5.1.2 the fire watch patrol in that fire zone will be removed.

(4) A letter has been issued to all project supervision to ensure all open items are properly identified on formal tracking systems.

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 4 1 0	8 6	— 0 0 8	— 0 2	0 2 OF 0 4

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

I. DESCRIPTION OF EVENT

On November 17, 1986 at 1505 with the reactor at 0% power and the mode switch in "REFUEL", the operations department at Nine Mile Point Unit 2 (NMP2) suspended control rod testing (single rod withdrawals) due to the uncertainty of secondary containment integrity. Earlier that day Niagara Mohawk (NMPC) site design engineering learned of several hundred unsealed conduits breaching various safety related fire barriers. Since the location of these breaches was not immediately known, secondary containment integrity could not be assured. But, upon further investigation it was concluded that the secondary containment integrity was not affected by the fire barrier breaches. Therefore, control rod testing resumed.

On the same day, the fire barriers were declared inoperable and fire watch patrols were established in the affected fire zones per Technical Specification 3.7.8. The breached fire barriers have been in this configuration since the receipt of the NMP2 operating license on October 31, 1986.

II. CAUSE OF EVENT

FSAR Section 9A.3.5.1.2 requires penetration seals (which provide a fire rating equal to the rating of the barrier itself) for openings through fire barriers which separate fire areas for pipe, conduit, and cable trays.

Several small diameter (3/4" and 1") field run embedded conduit fire barrier penetrations were not sealed during the construction phase of NMP2. (This affected approximately 450 junction boxes throughout the plant.)

The root cause for this failure to seal these conduit fire barrier penetrations is the failure of the contractor to follow established procedures for identifying incomplete construction work. The means of identifying incomplete construction work was to create an open item list on a formal tracking system. The contractor's construction department failed to do this as required by administrative procedures.

The contractor's construction department rediscovered that the field routed embedded conduit required sealing. This work received low priority. Additionally, the contractor's engineering department committed to an analysis to determine if this conduit needed sealing or met the performance requirements without sealing. However, neither the contractor's engineering or construction department established, in a timely manner, the incomplete status of the conduit penetrations on a formal tracking mechanism. This was not done until November 1986, after receipt of the NMP2 operating license. By this time the incomplete construction of these fire barrier conduit penetrations constituted a Technical Specification violation.

III. ANALYSIS OF EVENT

Our assessment is that the present as-built condition of the fire barriers still would provide a significant measure of fire protection between fire zones. This position is justified by the following:

(1) Small size of opening - The surface area of the worst case fire barrier breach (which is the sum total of all breaches in a fire barrier) is significantly less than that of a standard fire rated door with an undercut of 3/4". (See calculation on page 4)

(2) Normally closed conduit - the embedded conduit terminates in an enclosed box and is sealed by its continuous connection to a lighting or communication fixture or by a coverplate.

(3) Heat sink capability of the concrete fire barrier - each small diameter embedded conduit typically has a ten to forty foot run through the fire barrier, which provides a heat sink for the condensing and cooling hot gases as they flow through the conduit.

Considering the inherent strengths of the present fire barrier configuration we can conclude that the barrier will still provide significant protection against fire propagation. Additionally, the fire zones affected also utilize other methods of fire detection and suppression such as smoke/heat detectors and water and Carbon Dioxide suppression systems (as applicable). These systems provide early warning of a fire for prompt fire department response which in addition to the supplied suppression systems (as applicable), would aid in mitigating any consequences of the fire.

Therefore, considering the defense in depth design of the fire protection systems, the impact to plant safety from these unsealed conduits is considered minimal.

IV. CORRECTIVE ACTIONS TAKEN

(1) Fire watch patrols were established in the affected fire zones in accordance with Technical Specification Section 3.7.8.

(2) A modification was issued (#PN2Y86MX142) to seal the non-conforming conduits in accordance with FSAR Section 9A.3.5.1.2. The majority of this work was completed by late December 1986. Twenty four junction boxes affecting 17 fire hazards were not brought in compliance with the specification due to cable fill. In light of this the fire watch patrols are being maintained until this problem can be resolved either by licensing or design resolution.

(3) As a fire zone is brought into compliance with FSAR section 9A.3.5.1.2 the fire watch patrol in that fire zone will be removed.

(4) A letter has been issued directing all project supervision to be sure that all open items (construction, design, and operational) are properly identified on formal tracking systems using appropriate mechanisms.

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 4 1 0	8 6	— 0 0 8	— 0 2	0 4 OF 0 4

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

V. ADDITIONAL INFORMATION

No other NMP2 LER's cover events similar to that discussed in this report.

Calculation of the surface area of the worst case fire barrier breach.

Assumptions:

1) Calculation does not account for the reduction in flow surface area due to cables in the conduit.

2) One fire door per fire hazard.

n: number of unsealed conduit penetrations through the worst case fire barrier = 13
d: diameter of the conduit = 1.00 inch
A(c): x-sectional area of the conduit = (3.14 * d * d)/4 = .7854 square inches
A(w): total surface area of all unsealed conduit through the worst case fire barrier
A(w)= n * A(c) = 10.2 square inches
H(D): maximum height of standard fire door undercut = 0.75 inch (clearance, door bottom to floor)
W(D): width of standard fire door = 3.0 feet = 36.0 inches
A(D): surface area of standard fire door undercut
A(D)= H(D) * W(D) = 27.0 square inches

Therefore, the permitted open area A(D) of a rated fire door is greater by approximately a factor of 3 than the worst case unsealed (but enclosed by a junction box) fire barrier conduit penetration A(w).

Identification of Components Referred to in this LER

Component	IEEE 803 EIIS Funct	IEEE 805 System ID
Conduit	CND	FA
Penetration	PEN	FA
Fire Detector	28	IC
Fire Prot. (Water)	N/A	KP
Fire Prot. (Carbone Dioxide)	N/A	KQ
Fire Detection	N/A	IC