

Indian Point 3
Nuclear Power Plant
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John H. Garrity
Resident Manager

November 20, 1993
IPN-93-148

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Licensee Event Report 93-038-01
"Missing and Deficient Fire Barriers Place
the Plant Outside its Design Basis Due to
Personnel Error"

Dear Sir:

The attached supplemental Licensee Event Report (LER) 93-038-01 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in the requirements pursuant to 10 CFR 50.73(a)(2)(ii)(B). The attached supplemental report clarifies the report made in LER 93-038-00 and reports additional fire barrier deficiencies identified during the completion of the fire barrier wrap and radiant energy shield inspection program. Also attached are the new and revised commitments made by the Authority in this LER.

Very truly yours,

A handwritten signature in cursive script that reads 'John Garrity'.

John H. Garrity
Resident Manager
Indian Point Three Nuclear Power Plant

JHG/JC/vjm

cc: See next page

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PDR ADOCK 05000286
S PDR

Handwritten initials 'JHG' and the number '11' written vertically below them.

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Mr. Thomas T. Martin
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Attachment 1
List of Commitments

Number	Commitment	Due
IPN-93-148-01	One modification concerning the routing and separation of source range flux cables is currently under evaluation for its effect on 10 CFR 50, Appendix R, section III.G compliance. Evaluation of this modification and appropriate corrective actions will be completed prior to startup. (This replaces commitment 2 in IPN-93-130 dated October 29, 1993)	Prior to plant startup
IPN-93-148-02	the Project Engineering department will modify the wrap and radiant energy shields in ENG-534 fire barriers 3, 4, 8B, 9, 10, and 11 to provide compliance with Section III.G.2.f of 10 CFR 50, Appendix R. (This replaces commitment 3 in IPN-93-130 dated October 29, 1993)	Prior to plant startup
IPN-93-148-03	the Project Engineering department will protect the affected junction boxes inside and outside VC near penetration H20 (ENG-534 fire barriers 7 & 12). (This modifies commitment 4 in IPN-93-130 dated October 29, 1993)	Prior to plant startup
IPN-93-148-04	the Safety and Fire Protection department will revise surveillance procedure 3PT-R102, "Fire Barrier/Radiant Energy Shield Inspection" by February 28, 1993 to incorporate more stringent requirements for the inspection of fire barrier wrap configurations.	February 28, 1993

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)
Missing and Deficient Fire Barriers Place the Plant Outside its Design Basis Due to Personnel Error

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 NAME	DOCKET NUMBER
09	30	93	93	-- 038 --	01	11	20	93	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) N	POWER LEVEL (10) 000	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)					
		<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)					
		<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> OTHER					
		<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)					
		<input type="checkbox"/> 20.405(a)(1)(iv)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
		<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)						

Name Steven Wilkie, Fire Protection Engineer	TELEPHONE NUMBER (Include Area Code) (914) 736-6805
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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).	<input checked="" type="checkbox"/>	NO						

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On September 30, 1993, with the plant in cold shutdown, the Authority determined that the plant was not in compliance with 10 CFR 50, Appendix R, section III.G.2, in that fire barrier wrap was not installed or installed barriers were deficient for some specific plant areas. The most probable cause of the event was personnel error in that a modification performed to achieve compliance with 10 CFR 50, Appendix R, section III.G.2 was not expansive enough to envelop the three areas found deficient nor were maintenance or inspection procedures detailed enough to address deficiencies in installed wrap. Additional events were discovered during completion of field inspections. Corrective actions will include; improvements to the process utilized for development and review of 10 CFR 50, Appendix R related modifications, modifications to the deficient fire barriers to comply with 10 CFR 50, Appendix R, evaluation of a modification regarding its effect on Appendix R compliance and completion of detailed maintenance/repair and surveillance procedures for installed fire barrier wrap. Prior to startup, the Authority will achieve compliance with Appendix R section III.G.2 requirements.

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DESCRIPTION OF EVENT

On September 30, 1993, at approximately 1700 hours with the plant in a cold shutdown condition (reactor power level at 12 cps, reactor coolant temperature at 102 degrees F, reactor coolant pressure at atmospheric and pressurizer level at 23%), the Authority determined that the electrical penetration area both inside and outside the Vapor Containment (VC) building (near penetration H20), and the area above instrument racks #19 and #21 at the 68 foot elevation of the VC building were not in compliance with 10 CFR 50, Appendix R, Section III.G.2.

The Authority has initiated and is in the process of implementing a comprehensive fire protection improvement program. One aspect of the program involves verification of 10 CFR 50, Appendix R compliance. A part of this activity is being conducted under engineering acceptance test ENG-534, "Fire Barrier Wrap & Radiant Energy Shield Inspection." A specific task associated with this effort is the detailed review of fire barrier wrap (ISL) installations credited for 10 CFR 50, Appendix R, section III.G compliance. A detailed review of radiant energy shields is also required by the ENG. The completion of the ENG assures the functional integrity of fire barrier wraps and radiant energy shields to comply with 10 CFR 50, Appendix R.

In the course of reviewing the bases for the fire barrier wraps installed in the Indian Point 3 (IP3) VC building and electrical penetration area, the Authority determined that the wrap installations did not provide full compliance with 10 CFR 50, Appendix R, section III.G.2 for those areas. Significant Occurrence Report (SOR) 93-579 was initiated on September 30, 1993 reflecting that determination, and an assessment was made that showed that IP3 was outside its design basis relative to 10 CFR 50, Appendix R compliance for these three areas (fire barriers 7, 8A and 12 as defined in ENG-534). Additional inspections and evaluations of installed fire barrier wrap, in accordance with ENG-534, have also determined that in some instances, wrap is not installed in accordance with manufacturers' instructions and details. SOR 93-604, issued October 7, 1993, identified deficiencies in the wrap configurations for fire barriers 3 and 4 as defined in ENG-534. These barriers are located in the upper penetration area.

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In 1983, the Authority identified that the installation of fire barriers (in particular fire barrier wrap) was required, both inside and outside the IP3 VC building to achieve compliance with section III.G.2 of 10 CFR 50, Appendix R. A modification package was developed to address all associated fire barrier wraps (MOD 83-03-089 FP) required to achieve compliance. Wrap was to be installed as either a one hour fire rated barrier outside VC or as a radiant energy shield inside the VC. Fire barrier wrap, whether as a radiant energy shield or a one hour fire rated barrier is installed in three areas of the plant; the VC building, the electrical tunnel (entryway and penetration areas) and one small area of the primary auxiliary building. IP3 currently utilizes HEMYC fire barrier wrap manufactured by Promatec, Inc., Marinite board manufactured by Johns-Manville Corp., and Transite board manufactured by BNZ Materials Inc. in all applications used for compliance with section III.G.2 of 10 CFR50, Appendix R for one hour fire barrier and radiant energy shielding.

The modification specifically excluded installation of fire barrier wrap (fire barriers 7 and 12 as defined in ENG-534) around junction boxes for the Neutron Flux Source Range Channel I (N31) at penetration H20 in the upper electrical tunnel penetration area outside the VC and the penetration area inside the VC. It is indeterminate why the junction boxes were not wrapped. However, no justification was developed to address noncompliance with section III.G.2 of Appendix R for the area of the two junction boxes.

In addition, the modification did not address provisions for fire barrier wrap (fire barrier 8B as defined in ENG-534) around the conduits which exit above instrument racks #19 and #21 at the 68 foot elevation of the IP3 VC building. This deficiency existed even though preliminary reviews, prior to the modification, identified the need for fire barrier wrap around the affected conduits. The conduits are routed between the instrument racks and overhead cable trays, and contain cabling for the Pressurizer Level Transmitter LT-459 and Wide Range Steam Generator #31 Level Transmitter LT-417D, respectively.

The modification did address provisions for other barriers (fire barriers 3 and 4 as defined in ENG-534) in the upper penetration area. The ENG-534 inspection identified that the wrap was not in accordance with installation instructions. The cause of the deficiencies is indeterminate but is presumed to be incidental damage.

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The ENG-534 field inspections have been completed. The reactor remained in cold shutdown and was vented to atmosphere while the inspections were being completed. The reportable events identified during completion of the inspections are identified below by fire barrier number as defined in ENG-534.

- Fire Barriers 8B and 10

Fire barriers 8B and 10, located in the VC, are radiant energy shields which were installed improperly (not in accordance with installation instructions) such that proper separation does not exist. Both deficiencies were identified in Deviation Event Report (DER) 93-732 which was issued November 15, 1993. Fire barrier 10 is used to separate cable tray JA from redundant instrument trays over more than half of the VC circumference. There are deviations that appear to have resulted from inadequate construction. The deficiencies with fire barrier 10 consist of deviations in installation which included line of sight openings between cable tray JA and JB. However, the deficiencies identified do not significantly degrade the barrier.

Fire barrier 8B, located near instrument racks #19 and #21, separates one instrument channel required for safe shutdown. This barrier also has areas of degradation but there was no indication of the cause (e.g., minor inadvertent damage). The minor degradations identified for barrier 8B did not significantly degrade its overall capability.

- Fire Barrier 9

Fire barrier 9, located in the VC, is radiant energy shielding not in accordance with installation instructions. This deficiency was identified in SOR 93-649 which was issued October 15, 1993. The barrier separates redundant reactor coolant system pressure transmitters, PT-402 and PT-403, near VC penetration H-35. The barrier deviations consist of an open line of sight between redundant cables at penetration H35 and redundant instrument trays. There is approximately 10 feet of spatial separation where deficiencies exist. However, the deficiencies identified do not significantly degrade the barrier.

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- **Fire Barrier 11**

Fire barrier 11, located in the VC, is radiant energy shielding not in accordance with installation instructions. This deficiency was identified in DER 93-731 which was issued November 12, 1993. The barrier provides redundant instrumentation separation of steam generator level and pressurizer level at penetration H19 and reactor coolant system loop temperature at penetration H33. The shielding does not provide line of sight separation at the penetrations from redundant instrument trays, and appears to have resulted from poor installation. There is approximately 10 feet of spatial separation where deficiencies exist. However, the deficiencies identified do not significantly degrade the barrier.

CAUSE OF EVENT

The available evidence indicates personnel error in that a modification developed in 1984 did not fully ensure compliance with section III.G.2 of 10 CFR 50, Appendix R for the areas found with missing wrap. The cause of this specific deficiency is indeterminate because the key personnel involved in the original modification are no longer available for interviews or do not recollect events specifically enough to shed light on possible event contributors. Additionally, specific maintenance and repair procedures along with deficient surveillance procedures contributed to inadequate installation and maintenance of installed fire barrier wrap at IP3.

For fire barriers 8B, 9, 10 and 11, the available evidence indicates personnel error. The error appears to be inadequate construction for barriers 10 and 11. The error appears to be inadvertent damage for fire barrier 9. The error was indeterminate for barrier 8B. These fire barriers are defined in ENG-534.

CORRECTIVE ACTIONS

No immediate compensatory action is required because the plant is in the cold shutdown condition.

The following corrective actions will be performed prior to startup from the current outage to prevent recurrence of the event:

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- the Nuclear Engineering and Design department will improve the modification review process for effects on, and compliance with, Appendix R section III.G by revising the current Engineering Standards Manual section dealing with Fire Protection/ 10 CFR 50, Appendix R Compliance.
- the Safety and Fire Protection department has completed a review of all modifications performed at IP3 since the August 16, 1984 submittal. One modification concerning the routing and separation of source range flux cables is currently under evaluation for its effect on 10 CFR 50, Appendix R, section III.G compliance. Evaluation of this modification and appropriate corrective actions will be completed prior to startup. (This replaces commitment 2 in IPN-93-130 dated October 29, 1993)
- the Project Engineering department will modify the wrap and radiant energy shields in ENG-534 fire barriers 3, 4, 8B, 9, 10, and 11 to provide compliance with Section III.G.2.f of 10 CFR 50, Appendix R. (This replaces commitment 3 in IPN-93-130 dated October 29, 1993)
- the Project Engineering department will protect the affected junction boxes inside and outside VC near penetration H20 (ENG-534 fire barriers 7 & 12). (This modifies commitment 4 in IPN-93-130 dated October 29, 1993)
- the Safety and Fire Protection department will complete the development of specific maintenance/repair procedures covering installation and/or repair of associated fire barrier wrap configurations in use at IP3.
- the Safety and Fire Protection department will revise surveillance procedure 3PT-R102, "Fire Barrier/Radiant Energy Shield Inspection" by February 28, 1993 to incorporate more stringent requirements for the inspection of fire barrier wrap configurations. ENG-534 was recently used to perform the surveillance of fire barrier wrap configurations required for 10 CFR50, Appendix R compliance.

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The above corrective actions have been incorporated into a revision of Performance Improvement Plan (PIP) Item 177.1, "Implement Fire Protection Improvement/ 10CFR 50 Appendix R Compliance." The corrective actions listed above will serve to address the extent of condition for the event reported in this LER and previously reported in LER 93-18.

ANALYSIS OF THE EVENT

The lack of required fire barrier wrap and field deficiencies with installed fire barrier wrap and radiant energy shields are reportable pursuant to 10 CFR 50.73 (a) (2) (ii) (b). This is because the plant was found outside its design basis relative to 10 CFR 50, Appendix R, section III.G.2 compliance in the affected plant areas. This event does not involve violation of Technical Specification requirements. LER's 93-18 and 93-31 have previously been submitted relative to 10 CFR 50, Appendix R compliance and missing fire barrier wrap.

SAFETY SIGNIFICANCE

This event had no significant effect on the health and safety of the public. The Authority believes that the lack of required fire barrier wrap on the conduits above instrument racks #19 & #21, at penetration H20, inside and outside the VC building, and the noted field deficiencies with installed fire barrier wrap and radiant energy shields do not contribute to a significant degradation of capability to achieve safe shutdown of the plant.

This belief is supported by the general lack of contributing fire hazard both inside the VC building (near instrument racks #19 & #21 and the penetration area) and the electrical penetration area in the electrical tunnel. Existing fire hazards near the instrument racks or penetration area would be transient floor based. Administrative controls and the general lack of personnel entry, in each area, especially the VC during power operation minimize the probability of a transient induced fire. Additionally, the cabling exiting instrument racks #19 & #21 is contained in conduits prior to entry into the cable trays above each rack. The penetration area within the VC is provided with ionization smoke detectors that annunciate in the Central Control Room (CCR). In the electrical penetration area of the electrical tunnel ionization smoke detectors, heat detectors and a preaction sprinkler system are provided for the protection of cabling and equipment in the area.

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The conclusions remain valid for the deficiencies to fire barriers 8B, 9, 10 and 11 reported in this LER supplement. These four fire barriers, defined in ENG-534, are in the VC. Barrier 8B is at instrument racks #19 and #21 so prior assessments remain valid. Existing fire hazards near fire barriers 9, 10 and 11 are limited to floor based transients and cables. The conclusion that transient induced fires are minimized because of administrative controls and general lack of access remains valid.