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Docket No. 50-247

Mr. John D. O'Toole, Vice President Nuclear Engineering and Quality Assurance Consolidated Edison Company of New York, Inc. 4 Irving Place New York, New York 10003 Docket NRC PDR L PDR NSIC ORB#1 Rdg DEisenhut OELD IE ACRS-10 CParrish JThoma SVarga Gray

DISTRIBUTION

Dear Mr. O'Toole:

Enclosure 1 summarizes a meeting held on July 1, 1982 at your corporate headquarters to discuss our review of your compliance with Appendix R of 10 CFR Part 50. Enclosure 2 summarizes thet staff conclusions after a site visit conducted on July 13, 1982 to investigate methods of reducing the risk of core melt due to fires. Specific action items and schedules based on the results of Enclosures 1 and 2 will be the topic of future correspondence.

Sincerely,

Original signed by: S. A. Varga

Steven A. Varga, Chief Operating Reactors Branch #1 Division of Licensing

Enclosures: As Stated

cc w/enclosures: See next page

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Mr. John D. O'Toole

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Enclosure 1

Subject: Minutes of the Meeting to Discuss Indian Point 2 Appendix R Review

Location: New York, Con Ed building

Date: July 1, 1982

Participants:

NRC:	N. Fioravante	DSI/ASB
	B. Singh	DSI/ASB
	D. Kubicki	DE/CMEB
	P. Koltay	IP-2 Resident Inspector
Con Ed:	L. Liberatori	Licensing Engr.
	D. Rosh	IP-2
	P. Dugan	Elec. Engr.
	T. Wong	Elec. Engr.
	M. Drexel	Fire Protection Engr.
BNL:	A. Coppola	Reviewer
	E. MacDougall	Task Leader
	S. Karimian	Electrical Reviewer

A meeting to discuss the existing post fire safe shutdown capability and the requirements imposed by Appendix R to 10 CFR 50 for IP-2 was held in New York on July 1, 1982. The present alternate shutdown provisions for the plant were reviewed on a fire area by fire area basis. The highlights of the meeting and action items are discussed in this report.

Highlights

 There are some differences between a fire "area" as used in Appendix R and a fire "zone" as used in the licensee submittals. Some of the zones designated by the licensee are open to other zones. The Chemical Engineering Branch of NRC will review the licensee's designation of fire zones (see action item 13).

- The NRC representatives outlined the requirements for fixed fire suppression system for every fire area for which an alternate shutdown method is provided (see action item 1).
- 3. It was decided to use Table 3-1 (Attachment 1) of the licensee's May 17, 1978 letter to the NRC as a guide in discussing the alternate shutdown methods proposed. This table lists all the areas which contain equipment required for safe shutdown. A summary of discussion of all fire zones is provided in Attachment 2 which used the same listing and order of fire zones as in Attachment 1.
- 4. The associated circuit concerns were discussed at length. The licensee stated that all control and power circuits were protected by coordinated breakers, fuses, or relays and that their coordination program was an ongoing program.
- 5. The spurious signal problem for associated circuits was more clearly defined. The licensee will address this concern and the concern of common enclosures using a system's approach in future submittal (see action item 6).
- 6. The staff stated its concern regarding the loss of power on the site for 15-25 minutes while the gas turbines were coming on the line following a fire in electric tunnel, cable spreading room, or switchgear room (see action item 4).

- 7. The instrumentation required for post fire safe shutdown was discussed. The licensee has proposed supplying the following:
 - Pressurizer Pressure
 - Pressurizer Level
 - Steam Generator Pressure
 - Steam Generator Level

In addition to these, the staff reviewed the guidelines which require the addition of the following:

- Hot Leg Temperature
- Cold Leg Temperature or Tavq
- Source Range Flux Monitor
- Flow Monitoring (for systems used for safe shutdown)
- Tank Levels (for systems used for safe shutdown)

The licensee stated that flow indications in the form of pressure readings and tank levels were available locally. Temperature indications and source range flux monitor will be addressed by the licensee (see action item 12).

Action Items

Following action items were agreed upon to be provided by Con Ed:

 A list of the fire areas in which an alternative shutdown method is proposed, and the fire detection and fixed fire suppression system available in each of the listed fire areas will be identified. For fire areas where fire detection and fixed fire suppression are not available, Con Ed will modify the fire protection system or request an exemption from Section III.G.3 of Appendix R.

- 2. A description of the alternative shutdown systems available (primary water system) in the event of a fire in the component cooling pump room. The description will include any manual operations needed, manpower required and the time required to establish the alternative systems.
- 3. The procedure identification number and a summary description of the procedure for repair of the RHR power cables in the event of a fire which damages the RHR power cables.
- 4. Justify the use of or propose modifications to connections to the charging pump, component cooling pump and service water pump to assure timely operation of the alternate shutdown methods to mitigate effects of postulated fires in the critical fire areas.
- A summary description of the procedure for depressurization and use of S.I. pumps after loss of charging pumps. NRC (ASB) will review this procedure.

- Address the spurious operation of motor operated valves that may defeat shutdown system.
- A summary description of local operation of atmospheric dump valves in the event of loss of power and control for the atmospheric relief valves.
- 8. A description of safe shutdown equipment affected by fire in zone 62A (main boiler feedwater regulator area) and a description of the alternate shutdown capability for this zone.
- A description of the safe shutdown equipment affected by a fire in zone
 71A (reactor coolant pump area).
- 10. Address how natural circulation will be maintained in the event of loss of pressurizer heater.
- 11. Identify the location of cables for high-low pressure interfaces.
- 12. Address the availability of instrumentation required for post fire safe shutdown. The instrumentation will include hot leg temperature, cold leg temperature or T_{avg}, source range flux monitor, tank levels, and flow monitoring in the event of fire in the following areas:
 (i) cable spreading room, (ii) control room, (iii) switchgear room, and (iv) electric tunnel.

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- 13. CMEB to review fire zones to determine compliance with the fire area definition of Appendix R.
- 14. ASB to evaluate the use of condensate booster pump as proposed by the licensee in the event of loss of all AFW pumps.
- 15. CMEB to verify for fire zone 65A (main steam and feedwater value area) that fire zone designation is equivalent to a fire area.

ATTACHMENT 1

TABLE 3-1 OF CON ED'S MAY 17, 1978 LETTER REDUNDANT SHUTDOWN EQUIPMENT

ZONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
1	Component Cooling Pump Room	FUNCTION: Component Cooling COMPONENTS: All Component Cooling Pumps and associated electric cables	Cooling water for the Safety Injection (SI) Pumps and Residual Heat Removal (RHR) Pumps available from emergency connections to the Primary Water System and for the Charging Pumps from emergency connections to the City Water System.
1A	Electrical & Piping Pene- tration Area .	FUNCTION: Primary System Makeup COMPONENTS: Power and Control Cables for all Charging Pumps. Power cables for all Safety Injection (SI), Residual Heat Removal (RHR) and Component Cooling Pumps	Use secondary side heat removal to maintain plant in the hot shutdown condition. Effect emergency re- pairs by routing electrical cables to provide primary system makeup and shutdown to the cold condition.
		FUNCTION: Secondary System Makeup COMPONENTS: Control cables for motor driven Auxiliary Boiler Feed (ABF) Pumps	Provide makeup using steam driven ABF Pump. Operate motor driven ABF Pumps from remote shutdown panel.
		FUNCTION: Heat dump from the Primary System COMPONENTS: Power and Control Cables for Pressur- izer Relief and Spray Valves :	Dump heat through secondary system. Spring loaded Pressurizer Safety Valves available for Primary System dump.
2	Containment Spray Pump Room	FUNCTION: Component Cooling COMPONENTS: Power cables for all Component Cooling Pumps	Emergency cooling water for the SI and RHR Pumps available from the Primary Water System and for the Charging Pumps from the City Water System.
2A	Primary Water Makeup Pump Room	FUNCTION: Primary System Makeup COMPONENTS: Power cables for all Component Cooling Pumps Control cables for all Charging Pumps	Provide primary system makeup using SI and RHR Pumps and/or operate charging pumps locally. Provide Component Cooling water as noted for Zone 2.

ZONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
3A	Corridor	FUNCTION: Residual Heat Removal COMPONENTS: Power cables for all RHR Pumps	Remove residual heat by operating with secondary side of Steam Genera- tors flooded.
5	Charging Pump Room	FUNCTION: Primary System Makeup COMPONENTS: Power and Control cables for Charging Pump No. 21 Power cables for remaining two Charging Pumps	Provide makeup using SI and RHR Pumps.
6	Charging Pump Room	FUNCTION: Primary System Makeup COMPONENTS: Power and Control cables for Charging Pump No. 22 Power cables for Charging Pump No. 23 Remote operated valves - Refueling Water Storage Tank to Charging Pumps	Provide makeup using Charging Pump No. 21, SI and RHR Pumps: Water to Charging Pump provided through nor- mal path in the Chemical and Volume Control System.
6 A	Waste Storage and Drum Handling Area	FUNCTION: Primary System Makeup COMPONENTS: Power cables for all Charging Pumps	Provide makeup using SI and RHR Pumps.
7A	Corridor	FUNCTION: Primary System Makeup . COMPONENTS: Control cables for all Charging Pumps	Provide makeup using SI and RHR Pumps and/or operate Charging Pumps locally.
8	Boric Acid Tank Area	FUNCTION: Primary System Makeup COMPONENTS: All Boric Acid Transfer Pumps and associated electrical cables	Provide borated makeup water from the Refueling Water Storage Tank.
9	Safety Injec- tion Pump Room	FUNCTION: Primary System Makeup COMPONENTS: All SI Pumps and associated elec- trical cables	Provide makeup water using Charging and RHR Pumps.

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TABLE 3-1 (Sheet 2 of 7)

ZONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
10	Diesel Gen- erator Room	FUNCTION: Emergency power for shutdown equipment COMPONENTS: All Emergency Diesel Generators, Control Panel and associated elec- trical wiring	Power available to site from (2) 138kv feeders, (2) 13.8kv feeders and from gas turbines with black start capability.
11	Cable Spreading Room	FUNCTION: Primary System Makeup COMPONENTS: Power and Control cables for all Charg- ging, SI and RHR Pumps	Provide primary makeup water as noted for Zone 1A.
		FUNCTION: Heat dump from the Primary System COMPONENTS: Power and control cables for Containment Spray Pumps, Containment Fan Coolers, and Pressurizer Relief Valves	Dump heat through the Secondary System.
		FUNCTION: Heat dump from the Secondary System COMPONENTS: Power and control cables for the Atmospheric Relief Valves	Operate valves locally using all pneumatic control system.
		FUNCTION: A-C Vital Power COMPONENTS: Inverter and associated electrical wiring	Normal 480 Volt power available to operate equipment on the vital buses.
13A	Valve Room	FUNCTION: Primary System Makeup COMPONENTS: Power cables for all SI and RHR Pumps	Provide makeup using Charging Pumps. Remove residual heat by operating with secondary side of Steam Generators flooded.
14	Switchgear Room	FUNCTION: Primary System Makeup COMPONENTS: Switchgear, Power and Control cables for all Charging, SI, RHR and Com- ponent Cooling Pumps	Provide primary side makeup as noted for Zone 1A.

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TABLE 3-1 (Sheet 3 of 7)

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ZONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
14 cont'd	Switchgear Room	FUNCTION: Secondary System Makeup COMPONENTS: Switchgear and power cables for " motor driven ABF Pumps	Provide makeup using steam driven ABF Pump.
	· · ·	FUNCTION: Heat dump from the Primary System COMPONENTS: Switchgear, Power and Control cables for Containment Spray Pumps and Containment Fan Coolers	Dump heat through Secondary System.
		FUNCTION: Instrument Air COMPONENTS: Instrument Air Compressors	Reserve of high pressure gas bottles and provisions for interconnecting the Station Air System.,
15	Control Room	FUNCTION: All shutdown systems COMPONENTS: Control cables for all remote operated components Readout and control instrumentation Status annunciators and alarms	Shutdown using remote Pressurizer Pressure and Level Control Panel in the Primary Auxiliary Building and the remote Steam Generator Level Control Panel in the ABFP Building. Operate makeup equipment from local control panels.
18a -	Valve Room and Corridor	FUNCTION: Residual Heat Removal COMPONENTS: Power cables for all RHR Pumps	Remove residual heat by operating with secondary side of Steam Generators flooded.
22	Screen Well Area	FUNCTION: Heat removal from the Component Cooling System COMPONENTS: All Service Water Pumps and associated electrical wiring	Provide once-thru cooling water as noted for Zone 2. Remove heat from the secondary side as noted for Zone 3A.
23	Aux. Boiler Feed Pump Room	FUNCTION: Secondary Side Makeup COMPONENTS: Three Auxiliary Feedwater Pumps and associated power and control cables	Let the steam generators boil dry and remove heat from primary system by blow-off through the pressurizer relief valves into containment.

TABLE 3-1 (Sheet 4 of 7)

ZONE NO.	Zone name	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
27A	Corridor	FUNCTION: Electric Supply for motor operated safety-related valves COMPONENTS: Motor Control Centers 26A and 26B and	Operate valves manually.
32A	Electrical Tunnel	associated electrical wiring FUNCTION: Primary System Makeup COMPONENTS: Power and Control cables for Charging Pumps. Power cables for SI, RHR and	Provide primary side makeup as noted for Zone 1A.
		FUNCTION: Secondary System Makeup COMPONENTS: Control cables for motor operated ABF Pumps	Provide makeup by using steam driven ABF Pump or local operation of motor ABF Pumps.
		FUNCTION: Heat dump from the Primary System COMPONENTS: Power and Control cables for Pressurizer Relief Valves. Power cables for Contain- ment Fan Coolers and Containment Spray Pumps.	Dump heat through the Secondary System.
		FUNCTION: Heat dump from the Secondary System COMPONENTS: Power and Control cables for Atmos- pheric Relief Valves	Operate valves locally using all pneu- matic control system.
60A	Chemical Addition Area	FUNCTION: Heat dump from the Secondary System COMPONENTS: Power and Control cables for Atmospheric Relief Valves	Operate valves locally using all pheu- matic control system.
62A	Main Boiler Feedwater Regulator Area	FUNCTION: Secondary Side Makeup COMPONENTS: Main and two aux. feedwater regulators	Provide secondary side makeup using ABF Pumps and associated regulators.

TABLE 3-1 (Sheet 5 of 7)

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ZONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
65A	Main Steam and Feed- water Valve Area	FUNCTION: Secondary System Heat Dump COMPONENTS: Atmospheric Relief Valves and Main ¹⁷ Steam Safety Valves for: Steam Generator 21 and 22 (on Elev. 65') Steam Generator 23 and 24 (on Elev. 74')	Dump heat from alternate set of Re- lief and Safety Valves. (For fire on Elev. 65' use valves on Elev. 74' and the converse.)
71A	Reactor Coolant Pump Area	FUNCTION: Primary System Makeup COMPONENTS: Remote operated valves and associated electric cables for charging pumps and SI Pumps to the Primary System and for primary system to the RHR Pumps	Valves for SIS are in the safeguards position (open) during operation per- mitting use of the SI pumps for makeup.
- 72A	Outer Annulus	FUNCTION: Residual Heat Removal COMPONENTS: Remote operated valve and associated electric cables for primary system to RHR Pumps	Remove residual heat by operating with secondary side of Steam Generators flooded.
74A	Electrical Penetra- tion Area	FUNCTION: Primary System Makeup COMPONENTS: Same as Zones 71A and 72A	Provide primary system makeup as noted for Zones 71A and 72A.
		FUNCTION: Secondary System Makeup COMPONENTS: Control cables for motor driven ABF Pumps	Provide makeup using steam driven ABF Pump. Operate motor driven ABF Pumps from remote shutdown panel.
		FUNCTION: Heat dump from the secondary side COMPONENTS: Power and control cables for the Atmospheric Relief Valves	Operate valves locally using all pneumatic control system.
		FUNCTION: Residual Heat Removal COMPONENTS: Same as Zone 72A	Remove residual heat by operating with secondary side of Steam Generators flooded.

TABLE 3-1 (Sheet 6 of 7)

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SONE NO.	ZONE NAME	REDUNDANT COMPONENTS	ALTERNATE METHOD OF SHUTDOWN
74A cont'd	Electrical Penetra- tion Area	FUNCTION: Heat dump from the secondary system COMPONENTS: Power and Control for the Atmospheric Relief Valves	Operate valves locally using all pneumatic control system.
	. ¥	FUNCTION: Heat dump from the Primary System COMPONENTS: Power and Control cables for the Pressurizer Relief Valves. Power cables for the Containment Fan Coolers	Dump heat through the secondary side.
75A	Outer Annulus	FUNCTION: Heat dump from the Primary System COMPONENTS: Power and Control cables for the Pressurizer Relief Valves. . Power cables for the Containment Fan Coolers	Dump heat through the secondary side and RHR System.
77 A	Outer Annulus	FUNCTION: Primary System Makeup COMPONENTS: Remote operated valves and associated cables for SI Pumps to the Reactor Coolant System	Valves are in the safeguards (open) position permitting use of the SI Pumps. Charging Pumps also available.
78A	Recirc. Pumps and RHR Heat Exchanger Area	FUNCTION: Residual Heat Removal COMPONENTS: Remote operated valves for RPR Pumps to Reactor Coolant System and for Component Cooling Water to RHR Heat Exchangers	Remove residual heat by operating with secondary side of Steam Generators flooded.
106A	Tank Farm	FUNCTION: Primary System Makeup COMPONENTS: Refueling Water Storage Tank Primary Water Storage Tank	Provide makeup from the Water Factory using Boric Acid Transfer Pumps, Storage and Batching Tanks for boron addition.

TABLE 3-1 (Sheet 7 of 7)

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Attachment 2

Summary of Fire Zones Discussion

Zone 1 - Component Cooling Pump Room

The licensee described the proposed emergency connections to the primary water system and the city water system to obtain the required cooling for the charging pumps. The primary system connection is in place and only requires the _____ manual positioning of valves whereas the city water connection must be made up with hose and a spool piece.

Both BNL and NRC indicated that the primary connection was an acceptable alternative but the city water was not, since the making up of this connection constitutes a repair which is not allowed by Appendix R for hot shutdown.

The licensee will identify valves and procedures for primary water alternatives.

Zone 1A - Electrical and Piping Penetration Area

The alternative shutdown system proposed for this zone requires the installation of a "casualty" cable for the service water pumps, the component cooling pumps, the charging pumps, and motor control center no. 27. These "casualty" cables are the last link between the installed alternate shutdown system and the equipment noted. The emergency feeds proposed would come from the switchgear of the Indian Point 1 plant. The alternate for the auxiliary feedwater pumps only require the actuation of a manual transfer switch.

BNL and NRC indicated that the alternative for the auxiliary feedwater pump was acceptable, but that the alternatives for the service water pumps, the component cooling pumps, the charging pumps, motor control center number 27 and the RHR/SIS pumps were not acceptable since the action proposed constituted a repair which is not allowed by Appendix R.

The licensee is to review and re-evaluate their proposal, and submit other alternatives for those not accepted, or a request for exemption for this requirement.

Zone 2 - Containment Spray Pump Room

A fire here effects power cables for the component cooling pumps. The discussion and comments are the same as Zone 1. (It should be noted that the allowable alternative applies to cooling water for the S.I. and RHR pumps, and the dis-allowed method applied to the charging pumps. This was not stressed at the meeting).

Zone 2A - Primary Water Storage Tank Room

The proposed alternate for this area involved making up an emergency connection between the city water system and the primary water system as in Zones 1 and 2 above.

This again is not acceptable under Appendix R since it constitutes a repair.

The licensee will submit an alternative or justification for position that this procedure does not constitute a repair.

Zone 3A - Corridor (P.A. Building)

The alternative was changed to repair of the RHR power cables which is allowable for cold shutdown equipment under Appendix R. This cabling is available. on site and procedures for this repair exist.

NRC recommended that they should have cables with lugs attached and all other preparations required for installation.

The licensee will provide procedures or description.

Zones 5 through 9 - Alternatives Acceptable

The licensee will provide procedures or describe actions taken by operator when using SI pumps as alternate for charging pumps (i.e., depressurization to allow use of SI pumps).

Zone 10 - Diesel Generator Room

A fire in the diesel generator room could cause the loss of all emergency power loads that are on the diesels. If this occurred at the same time that regular off site power is lost, the gas turbines could be used as a backup power source. This would involve a 15-25 minute blackout of power until the gas turbine comes up on line.

The licensee will address this problem in their next submittal.

Zone 11 - Cable Spreading Room

For the primary system makeup, the alternatives require repairs as indicated for Zone 1A and the same comments apply. For heat dump from the primary system, the alternative is the preferred method. Heat dump from the primary system is to be avoided. Local operation of the secondary atmosphere relief valves is acceptable. All D.C. power system cables and all the cables routed for the control room pass through the cable spreading room. Loss of the cable spreading room causes a control room blackout, since all the motor operated valve control cables are routed through this room. Spurious signals could be generated, and since the control room is without D.C. power, operators will not be able to determine which valves are opening or closing.

The licensee will look into the design and will determine which additional safety or nonsafety motor operator valves could affect safe shutdown operation. The licensee will address loss of D.C. power and instrumentation considered necessary for shutdown.

Zone 13A - Valve Room

The use of charging pumps is acceptable (preferred) and the alternative for RHR pumps is to repair the damaged power cables (same as Zone 3A).

Zone 14 - Switchgear Room

A fire in the switchgear room could cause the loss of all power for the safety related pumps. For primary system makeup, the alternatives proposed and the comments are the same as for Zone 1A.

For secondary system makeup, the use of the steam driven auxiliary feed pump is acceptable for heat dump through the primary system, the comments are the same as for Zone 11.

For instrument air the alternative is acceptable. Licensee stated that D.C. power is still available to the control room for fire in Zone 14 and that instrumentation would not be effected. The licensee will review control cables and associated circuits for spurious signals which would affect safe shutdown (see Enclosure 1 for discussion on associated circuits).

Zone 15 - Control Room

A control room fire could cause the loss of the use of the control room to shut the plant down and damage to cables that could effect instruments and controls required for safe shutdown.

This concern has not been adequately addressed in the submittals received to date and the licensee was so advised.

In his resubmittal the licensee will show how he plans to shut the plant down without the use of the control room without the use of the controls and instrumentation that could be lost in a control room fire. The licensee will include in this submittal an analysis of the effects of associated circuit problems noted in Enclosure 1.

Zone 18A - Valve Room and Corridor

The proposed alternate is changed to repair of RHR power cables as for Zone 3A.

Zone 22 - Screen Well Area

The proposed alternative constitutes a repair (for the charging pumps) and is not acceptable for hot shutdown under Appendix R. The licensee is to submit alternative or justification for exemption.

Zone 23 - Auxiliary Boiler Feed Pump Room

The proposed alternative is not acceptable.

The licensee outlined another method which has been used successfully. This involves using the condensate pumps (which are on the bus fed by the gas turbines) to feed the steam generators directly, with the steam generators ' depressurized to less than 500 psi using the atmospheric steam dumps.

The NRC (Auxiliary System Branch) is to review this new alternative to determine feasibility.

Zone 27A - Corridor (P.A. Building)

The alternative proposed, manual operation of valves, is acceptable.

Zone 32A - Electrical Tunnel

For primary system makeup, repairs are unacceptable, see Zone 1A. For secondary system makeup, steam driven auxiliary feed pump or local operation of motor driven auxiliary feed pump is acceptable. For heat dump from secondary system, local operation of valves is acceptable. Other comments similar to Zone 11. A fire in this zone could cause a loss of all MOV's due to spurious signals from shorts, grounds or opens in the MOV circuits.

Zone 60A - Chemical Addition Area

The alternative shown on Table 3-1 is acceptable. Also, code safeties are available as backup.

Zone 62A - Main Boiler Feedwater Regulator

Some discussion on misleading nomenclature. The licensee stated that auxiliary feed regulators are still available. The licensee will provide better description of what is lost.

Zone 65A - Main Steam and Feedwater Valve Area

Proposed alternatives are acceptable if fire zone designation is correct. The NRC (CMEB) is to check area from fire engineering viewpoint.

Zone 71A - Reactor Coolant Pump Area

The licensee stated that there were no motor operated valves in this area. The licensee will re-assess valves affected by fire in this area.

Zone 72A - Outer Annulus

Proposed alternative, shown on Table 3-1, was changed to operating valves manually. This is acceptable. The NRC (CMEB) to examine extent of zone separation.

Zone 74A - Electrical Penetration Area

For primary system makeup, same remarks as for Zones 71A and 72A. The licensee will review valve actuation possible by spurious signals as in Zone 14. Alternate for secondary system makeup, heat dump from secondary side, is acceptable. Alternate for RHR changed to repair and/or manual operation of valves as in Zone 72A.

Zone 75A - Outer Annulus

Alternative proposed is preferred method of heat removal. Question of inadvertant opening of pressurizer relief valves is related to fire induced - LOCA - see Enclosure 1.

Zone 77A - Outer Annulus

Proposed alternatives, shown in Table 3-1, are acceptable.

Zone 78A -Recirculation Pumps and RHR Heat Exchanger Area

Proposed alternative, shown in Table 3-1, changed to manual operation of valves. This is acceptable.

Zone 106A - Tank Farm

This zone should be removed from the list.

INDIAN POINT UNIT 2 SITE VISIT OF JULY 13, 1982

ENCLOSURE 2

The Indian Point Probabilistic Safety Study (IPPSS) identified certain postulated fires that could result in a major contribution to the risk of core melt. These fires are postulated to cause the failure of the reactor coolant pump (RCP) seals due to a loss of seal cooling resulting in a LOCA and the inability to mitigate the consequences of the LOCA because of the loss of power to the component cooling water pumps, the charging pumps, safety injection pumps, and the service water pumps, as a direct consequence of a fire in such critical areas as the switchgear room, the electric tunnel, or the cable spreading room.

The staff's review of the requirements of Appendix R to 10 CFR Part 50 will assure that a safe plant shutdown can be accomplished given a fire in any area of the plant. The staff's review of the licensee's Appendix R submittal has progressed to the point that a meeting was held with the licensee to discuss certain open items including the above concern. This meeting took place on July 1, 1982. Due to the nature of the open items it was recognized that time would be required to allow the licensee to respond to these matters and for the staff to complete its review. The time required to make any needed modifications in the plant could also be lengthy. A site visit was therefore made on July 13, 1982 in order to develop staff recommendations for an interim course of action (pending completion of the Appendix R review) that would reduce the risk of core melt due to fires. As a result of the staff's examination of the Indian Point 2 critical plant areas and the alternate shutdown capability as proposed by the licensee, we conclude that there are a number of modifications beyond those proposed by the licensee which can be quickly installed and which will aid in mitigating, to a significant extent, the risk of core melt due to fires in the critical areas.

The licensee has proposed an alternate shutdown system which is independent of the three critical areas discussed above (electrical tunnel, switchgear room and cable spreading room). Included in this proposal are emergency power connections from the Indian Point 1 440 V switchgear to the Indian Point 2 components essential for safe shutdown. The Indian Point 1 440 V switchgear normally receives its power from the Buchanan 13.8 KV system through three separate underground feeders to separate 1250 KVA, 13.2 KV/440 V transformers to the individual 440 V switchgear sections. The 13.8 KV feeders can be connected to three gas turbines (one at the Indian Point Site and two at the Buchanan substation). The onsite gas turbine is connected to the Indian Point 1 440 V switchgear and can be manually started from the Indian Point 2 control room.

The licensee has proposed to use the onsite gas turbine as an alternate backup power source in case of loss of normal emergency power at Indian Point 2 and concurrent loss of offsite power. The feeder lines from the Indian Point 1 440 V switchgear to the primary auxiliary building and the auxiliary feedwater pump room of Indian Point 2 are presently installed to local junction boxes in the vicinity of the vital components and are independent of the critical fire areas discussed previously.

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A permanent hardwire connection is provided for one motor-driven auxiliary feedwater (AFW) pump for secondary makeup water to the steam generators for decay heat removal. The power cable connected to the AFW pump requires a manual transfer from the normal power supply to the backup power supply via a transfer switch. The licensee has proposed to run temporary cables from three junction boxes to various other components required for safe shutdown. The cable is stored on site. The proposed temporary connections are from local junction boxes to the following components:

(a) A service water pump.

(b) A component cooling pump and motor control center 27.

(c) A charging pump, a safety injection pump, and an RHR pump (any two out of three types of pumps can be connected at a time).

The licensee indicated that the make-up of these temporary connections would require approximately one to two hours. Activation of the gas turbine would require approximately 11 to 15 minutes. This compares with a 30 minute time limit until failure of the reactor coolant pump seals from the time of loss of seal cooling as postulated by the IPPSS.

We have reviewed the modifications proposed by the licensee and while we agree with the proposal in general, we have concluded that a more timely method of getting power to the essential pumps necessary for safe shutdown and prevention of loss of RCP seal cooling is required. To achieve this goal, we recommend the following be provided:

- 1. A hard wire connection from the local junction box to the service water pump for secondary cooling of the component cooling water system.
- 2. A hard wire connection from the local junction box to the component cooling water pump for cooling of the RCP seals.
- 3. A hard wire connection from the local junction box to the charging pump for. the reactor coolant pump seal injection and primary system makeup, and boration.

These permanent hardwire connections would permit use of the backup power supply by manual transfer from the normal power supply to the backup power supply via a transfer switch.

We further conclude that procedures should be developed which:

- a. Identify the various actions required for alternate safe shutdown. This procedure should incorporate the above referenced modifications.
- b. Contain steps that should be taken to start up and provide the on-line service of the gas turbine after a fire.

We conclude that the implementation of these recommendations by the licensee will reduce the contribution of fire to the risk of core melt. These recommendations can and should be implemented quickly pending completion of the staff's review of the licensee's Appendix R submittal. Further it is believed that implementation of these recommendations will resolve, in a large part, the concerns identified in the staff's Appendix R review.