POWER AUTHORITY OF THE STATE OF NEW YORK
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October 23, 1978
IPO-163

Director, Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. A. Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors

Subject: Indian Point 3 Nuclear Power Plant
Fire Protection Review
Docket No. 50-286

In response to your letter of September 29, 1978 concerning the subject item, enclosed please find ten (10) copies of Attachments 1 and 2 which address your Enclosure 1 requests for additional information and your Enclosure 2 Staff Position, respectively.

Very truly yours,

Paul J. Early
Assistant Chief Engineer-
Projects

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ATTACHMENT 1

RESPONSES TO NRC REQUEST OF SEPTEMBER 29, 1978 FOR ADDITIONAL INFORMATION (ENCLOSURE 1) ON FIRE PROTECITON PROGRAM

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
OCTOBER, 1978

Question No. 11

Provide the following design criteria details for proposed additons to fire protection systems:

a. Fire Pumps - number, rated capacity, rated pressure, type drive, electrical power arrangement, starting arrangement.

b. Fire Water Tanks - number, capacity

c. Fire Underground - drawings on location of piping, valves and hydrants.

d. Sprinklers (in safety-related areas) - type system, actuation method, design densities, water flow alarms.

e. Hose Stations - minimum nozzle pressure at design flow rates.

f. Fire Detection Systems - emergency power supply, electrical circuit supervision, use of approved components.

g. Fire Doors and Dampers - locations, fire ratings.

h. CO_2 Systems - concentrations, soak times, actuation method.

Response

a. Fire Pumps

Number	2
Rated capacity	2500 GPM
Rated pressure	110 psig
Type of drive	one electric motor driven one diesel engine driven
Electrical power arrangement	The Motor Driven Fire Pump will have its normal power supply from a new 480 volt switchgear to be located in the turbine bldg. at elevation 15 feet. A stand-by power feed will be provided from an existing 480 volt Class 1E Switchgear. If the normal power supply fails, the pump can be run from the standby Class 1E power source.

Starting arrangement — Automatic, on pressure drop in the main fire loop below a pre-set point.

b. Fire Water Tanks

Number — 2
Capacity — 350,000 gallons each, 300,000 gallons in each tank are reserved for Fire Protection

c. Fire Underground — Attached is a drawing M095 showing the piping arrangement, valves and hydrants.

d. Sprinklers (in safety-related areas)

Area	Type of System	Actuation Method	Design Densities	Water Fl Alarms
Diesel Gen. Bldg. Gen.# 31,32, & 33	Wet-pipe Hydraulic design	Automatic	0.3 GPM/Ft^2 for entire area.	Yes
Penetration Area & Tunnel EL.33'-0"	Dry-pipe preaction	Automatic	30 GPM/Sprinkler (0.35 GPM/Ft.^{2} of cable tray area).	Yes
Penetration Area & Tunnel EL.43'-0"	Dry-pipe preaction	Automatic	30 GPM/Sprinkler (0.4 GPM/Ft.^{2} of cable tray area)	Yes
Primary Aux. Bldg. EL.55'-0"	Dry-pipe Preaction	Automatic	0.3 GPM/Ft.^{2} for entire MCC area.	Yes

e. Hose Stations — Minimum nozzel pressure at design flow rates shall be in conformance with NFPA standard 14, not less than 65 psi at the outlet with 500 GPM flowing from the outlet.

f. Fire Detection Systems — Shall have emergency power supply. All circuits shall be electrically supervised. All components shall be UL approved and FM listed.

g. Fire Doors and Dampers

Location (see drawings A019 and A021)	Fire Rating
Control Bldg. to Turbing Bldg. EL. 15'-0"	U.L. 3 Hour Rating
Control Bldg. to Stair EL. 15'-0"	U.L. 3 Hour Rating
South Wall of Control Bldg. to Sump Pump Rm. EL. 15'-0"	U.L. 1½ Hour Rating
West Wall to Diesel Gen. Bldg. EL.15'-0"	U.L. 3 Hour Rating
Diesel Gen. Bldg. EL. 15--0" Between the three Gen. Rms. (4 Doors)	U.L. 3 Hour Rating
East Wall of Diesel Gen. Bldg. EL.15'-0"	U.L. 3 Hour Rating
Control Bldg. to Turbine Bldg. EL. 36'-9"	U.L. 3 Hour Rating
Control Bldg. to Stair EL. 33'-0"	U.L. 1½ Hour Rating
South Wall of Control Bldg. to Air EL. 33'-0"	U.L. 1½ Hour Rating
West Wall of Control Room to Turbine Bldg. EL. 53'-0"	Bullet resistant (class 4 as required by 10 CFR 73.55 (c) (6). Approved by American Nuclear Insurers (ANI).
East Wall of Control Room to Stair EL. 53'-0"	Bullet resistant (class 4) as requested by 10 CFR 73.55 (c)(6). Approved by American Nuclear Insurers (ANI).
Northeast Wall of Diesel Gen. Bldg. EL.43'-6"	U.L. 3 Hour Rating
North End of Diesel Gen. Bldg. EL. 43'-6" (Between the Gen. Rooms, Two doors)	U.L. 3 Hour Rating

Cable Tunnel [redacted]try EL. 33'-0"	[redacted]. 3 Hour Rating
Fire Damper Between Turbine Bldg. & Control Bldg. EL. 33'-0"	U.L. 3 Hour Rating
Fire Damper Between Turbine Bldg. & Control Bldg. EL. 15"-0"	U.L. 3 Hour Rating

h. CO_2 System

System	Concentration	Application Time (Soak Time)	Actuation Method
Cable spreading rm. Control Bldg. EL. 33'-0"	50%	Total Flooding (10 min.)	Automatic - additional application manual
Relay Room Control Bldg. EL. 15'-0"	50%	Total Flooding (10 min.)	Automatic additional application manual

Question No. 12

Verify that the design density of the sprinkler system protecting the electrical tunnel will comply with NFPA Std. 15-1977.

Response

The design density of the preaction dry pipe system, protecting the electric tunnel is based on 30 GPM/Sprinkler head. The sprinkler heads are distributed 10 feet apart covering the bottom surface of the tray above and the top surface covered by each sprinkler head is 40 square feet, i.e. the density is 0.75 GPM/square foot of tray area which exceeds the NFPA Std. 15-1977 requirements of 0.3 GPM/Sq. Ft.

Question No. 13

Verify that all fire detectors used in the existing system in safety-related areas are approved by Underwriters Laboratories or Factory Mutual.

Response

All Fire Detectors used in the existing system in safety related areas are approved by Underwriters Laboratories.

Question No. 14

Verify that smoke detectors will be provided over the instrument racks on the east side of the control room.

Response

The Power Authority will provide ionization type smoke detectors at several locations above the analog instrument racks on the East side of the Control Room.

Question No. 15

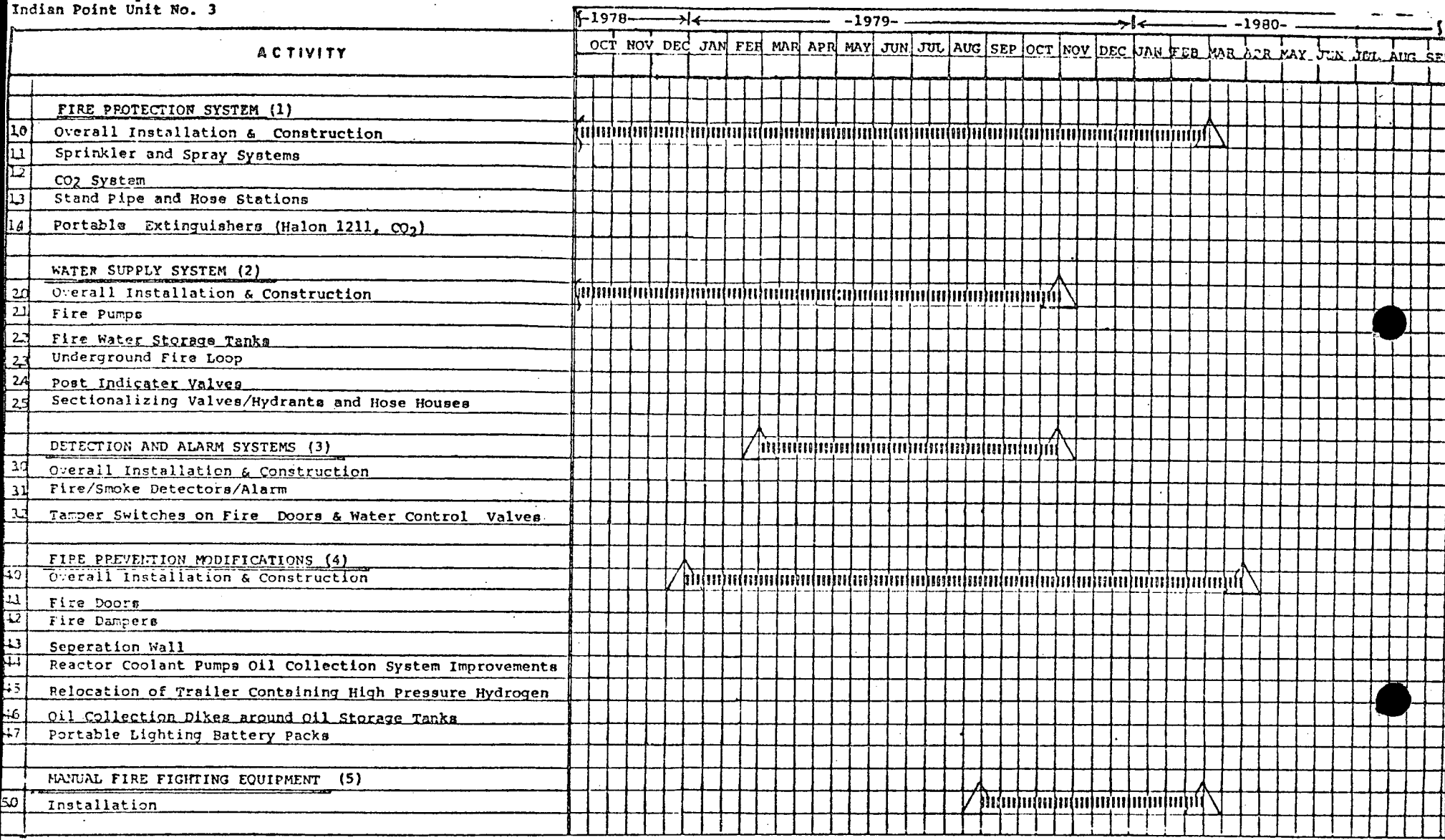
Provide a schedule for implementation for modifications referenced above and those previously identified in the Indian Point Fire Protection Program description of April 1977 and the PASNY letter to NRC of June, 1978.

Response

Attached is the projected schedule for implementation of present committed modifications, those identified in the Indian Point Fire Protection Program description of April 1977 and the Authority letter to NRC of June, 1978.

Power Authority of the State of New York
Indian Point Unit No. 3

Schedule of Installation & Construction of Modifications to Fire Protection Systems for Indian Point Unit



NOTES:

(1) New and modification to existing systems. Ref: B.T.P. F.3,F.5,E.3(d), P9 & R.F.A.I NRC letter of 9/29/78 item 11.d.

(2) Ref: B.T.P. E.2(c),E.2(d),E-2(a), & E.2 (g), F.16, R.F.A.I. NRC letter of 9/29/78 items P19 (a), (b), (d), (e) & (g).

(BTP - Branch Technical Position)
(RFAI - Request for additional Information)

(3) Ref: B.T.P. F.6,F.11,F.12, R.F.A.I. NRC letter of 9/29/78 items P16, P18 & P10.

(4) Ref: B.T.P. D.1(h), F.5,D.4(e),D 5, B.2, D.2(d) R.F.A.I. NRC letter 9/29/78 P12, P13 & P3.

(5) Ref: R.F.A.I. NRC letter 9/29/78 items P 20(a), (b) & (c).

Question No. 16

Provide the results of an analysis to substantiate that fires in radwaste material at the storage locations will not cause loss of equipment used to prevent releases to the environment, or will not result in excessive releases to the environment. In addition, describe how inhalation and exposure doses to firefighters are kept within acceptable limits.

Response

(a) IP3 - Drumming Station & Storage Area (PAB-El. 55')

The drumming station is used to store high and low specific activity solid waste (evaporator bottoms, spent resin, spent filter cartridges, etc.) This area is ventilated by the PAB ventilation system and, therefore, any released from the area will be contained and controlled.

The drumming station does not contain any ventilation equipment and a further review has determined that there are no power supplies, power cables or control cables for any plant ventilation equipment used to contain radioactive releases within the area.

In summary, a fire in the drumming station will not result in excessive releases to the environment and will not cause the loss of equipment used to prevent releases to the environment.

A conservative calculation was performed to demonstrate that there would be no excessive releases to the environment. For this calculation, it was assumed that all the waste shipped from IP-3 in four shipments in August 1978 was involved in a fire and that the entire radioactive content was released with no filtration or other removal over a period of two hours. The quantity of material was 5000 cubic ft. and with a curies content of approximately 16 curies. The atmospheric dispersion factor provided in our technical specification was used to determine radioactive concentrations inhaled by a man at the side boundary.

If conditions described above occurred, the dose to a side boundary individual's lungs and his whole body would be less than .01 millirem.

(b) For those individuals fighting fires in radwaste material storage locations, health physics monitoring and the use of breathing apparatus maintain inhalation and exposure doses within acceptable limits. More detail on this matter is provided in the emergency plan, emergency plan implementation procedure and Site Health Physics procedures.

Question No. 17

Verify that the capacity of the new fire pumps will meet the water demand of the largest water sprinkler or deluge system plus 750 GPM for hose stations.

Response

The capacity of the new fire pumps is designed to meet the water demand of the largest water sprinkler or deluge system plus 750 GPM for hose streams.

Question No. 18

Describe where the audible alarm and visual indication will be located for the fire protection "run" and "trouble" alarms when modifications are complete.

Response

All audible and visual alarms and indicators for fire and trouble will be located on a central Fire Display and Control Panel in the Control Room, and on local fire panels.

Question No. 19

Describe the construction of the sound absorbing panels in the control room including combustible components and their combustion properties.

Response

The wall construction in the control room consists of a concrete wall finished with aluminum faced gypsum wall board supported on metal fairing.

Starting nine feet above the floor, a three foot high area running the perimeter of the control room is covered with perforated aluminum acoustical panels backed with fiber-glass batt insulation. This construction continues on the ceiling covering a three foot wide area running the perimeter of the room.

The roof of the control room is concrete. A 1/4" thick flat transite reflective ceiling is suspended 2 1/2 feet below the concrete. Metal flourescent lighting fixtures with aluminum egg crate louvers are suspended 2 1/2 feet below the transite. Support is provided by 1/4" diameter steel rods, steel unistrut and steel and aluminum angles.

ATTACHMENT 2

RESPONSES TO NRC STAFF POSITIONS OF SEPTEMBER 29, 1978 (ENCLOSURE 2) ON FIRE PROTECTION PROGRAM

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
OCTOBER, 1978

STAFF POSITION P3

Normal and emergency lighting could potentially be damaged for fires in various areas. To preclude loss of lighting required in a fire situation, fixed lighting units consisting of eight hour battery packs should be provided for access lighting in passage ways to safety-related areas and in the control room or it should be shown that fires in various areas would not cause loss of lighting in the control room or in passage ways which provide access to safety-related areas.

Response

The Power Authority will install fixed lighting units consisting of eight hour battery packs in the control room and areas providing access to locations containing safe shutdown components where fire could damage normal and emergency lighting circuits, thereby hampering fire fighting efforts.

STAFF POSITION P4

Cable penetration firestops should be qualified to a rating equal to the rating required of the fire barriers. Firestop qualification may be accomplished by performing tests of the IP-3 firestop design to show conformance with the following position and provide the results of such testing, or by providing the results of tests on equivalent design which have already been qualified and the basis for the equivalency. The tests should be performed in accordance with ASTM E-119, with the following exceptions:

a. The cable used in the test should include the cable insulation material used in the facility.

b. The test sample should be representative of the worst case configuration of cable loading, cable tray arrangement and anchoring, and penetration firestop size and design. The test sample should also be representative of the cable sizes in the facility. Testing of the penetration firestop in the floor configuration will qualify the firestop for use in the wall configuration also.

c. Cable penetrating the firestop should extend at least three feet on the unexposed side and at least one foot on the exposed side.

d. The firestop should be tested in both directions unless the firestop is symmetrical.

e. The firestop should be tested with a pressure differential across it that is equivalent to the maximum pressure differential a firestop in the plant is expected to experience.

f. Temperature levels of the cable insulation, cable conductor, cable tray or conduit, and firestop material should be recorded for the unexposed side of the firestop.

g. Acceptance criteria - the test is successful if:

   1. The cable penetration firestop has withstood the fire endurance test without passage of flame or ignition of cable on the unexposed side for a period equal to the required fire rating, and

   2. The temperature levels recorded for the unexposed side are analyzed and demonstrate that the maximum temperatures are sufficiently below the cable insulation ignition temperature, and

   3. The firestop remains intact and does not allow projection of water beyond the unexposed surface during the hose stream test.

Response

In Unit 3, firestops are provided where cable trays pass through walls and floors, and enter switchgear or other equipment. Three types of firestops are used according to the function of the cable in the tray (control, power, etc,) and ventilation requirements of the areas involved. The first

type of firestop is used in trays containing control cables passing through walls, floors, or into equipment where an air seal is not required. It is composed of two alumina-silica ceramic fiber blankets, 36 inches long, laid in the tray and compressed around the cable by the cable tray cover. An ignited cable would be extinguished by this firestop because the ceramic fiber blanket limits the oxygen supply. The blanket has a low thermal conductivity and can be used at temperatures up to 2300°F, without showing any physical change. Even beyond that temperature, it retains its fire retardant characteristics.

Because of its low thermal conductivity and the fact that it covers three feet of cable surface area, this blanket cannot be used with power cable, which generate considerable amounts of heat. In addition, it cannot easily be installed in control trays, where an air seal of the wall or floor opening is required for ventilation purposes. The firestop used for these configurations consists of (1) a transite sheet to substantially close the opening, (2) Flamemastic 71A Mastic sprayed on the cable for 6 inches on either side of this sheet, and (3) Flamemastic 71A Mastic trowelled into the cable tray on top of the cables to seal any remaining air passage between rooms. Flamemastic 71A has been accepted and used by a number of utilities for this purpose. It is non-toxic, not damaging to cable insulation, and requires no derating of cables when applied over a one-foot section. Tests by various power companies and cable manufacturers have shown that a 1/16" coating of Flamemastic 71A will not burn through after 15 minutes exposure to a propane torch at 2050°F.

The third type of firestop is used only for openings in the floor where control or power cables enter switchgear, motor control centers, supervisory cabinets, or other equipment from the tray below. This configuration combines packed fiberglass with a 1/4" coating of Flamemastic 71A sprayed on either side of the closure. It provides both protection and separation of cable as they pass through the floor. This type of firestop is used where control cables enter the panels in the Control Room.

The details of construction for the Indian Point Unit No. 3 firestops are shown on UE & C drawing 9321-F-31603. These firestops are very similar to cable firestops in use at Florida Power and Light Company's Turkey Point Units (Docket Nos. 50-250, 251) as described in their FSAR Figures 8.2-19 and 8.2-20 and discussed in Section 3.2, pages 3-9 through 3-19, of their submittal for Turkey Point Units 3 & 4 "Fire Protection - a Reevaluation of Existing Plant Design Features and Administrative Controls".

The qualification of the Turkey Point firestops to ASTM E119-73 as indicated on page 3-11 of their Fire Protections submittal applies equally to the fire stops in use at Indian Point Unit No. 3 for the following reasons:

1) The materials used to construct the firestops are indentical - flame mastic 71A, fiberglass, and 1/4" transite.

2) The lack of transite top and bottom covers for trays in the Indian Point 3 firestops is not considered significant, since an extra margin or protection is provided in the Indian Point 3 firestops by each cable's individual asbestos jacket.

It shoud be noted that in the November 11, 1975 test described in Section 3.2.1 of the Turkey Point Fire Protection Document, penetrations #1 and #5 had no marinite or transite sleeves clamped around the tray, penetrations #2 and #6 had sleeves only on the cold side of the penetration and penetration #6 had a marinite collar on the cold side only of the penetration.

The successful results of the tests for all 8 of the penetration types tested, demonstrated that the flamastic/fiberglass combination would maintain its integrity as a fire barrier under direct flame impingement and that elimination of the transite or marinite covers and/or flashing would not lead to a failure of the fire barrier.

The inspections following the Primary Auxiliary Building fire at Indian Point 2 which occurred on November 4, 1971 affirmed the effectiveness of the firestop design in preventing the spread of fire through firestopped floor slots below motor control centers 26A and 26B which were located immediately above the fire source.

In summary, the fire stops in use at Indian Point Unit No. 3 are demonstrated to be qualified to their required ratings as fire barriers. To provide even further assurance, however, that critical fire barriers will perform up to their required rating, all critical fire barriers will be upgraded to include Marinite collars and sleeves. Critical fire barriers include those between the Indian Point 3 Control Building and Turbine Hall and the Indian Point 3 Diesel Generator Building and Electrical Tunnel.

STAFF POSITION P6

To prevent an electrical cable fire inside of containment from resulting in loss of vital instrumentation required for safe shutdown, barriers or insulation should be provided where redundant cabling for steam generator level and pressurizer pressure and level instrumentation are routed in proximity to each other. Marked-up drawings showing the routing of pressurizer pressure and level and steam generator level instrumentation cabling inside of containment should be provided.

Response

Barrier (masonite board) are provided between cable trays where redundant instrumentation circuits required for safe shutdown are routed in proximity to each other in the containment. Drawings listed on the attached drawing list have been marked to show the routing of cables for the steam generator level and pressurizer pressure and level instrumentation from the instrument racks where they originate to the containment penetrations. Four redundant sets of instruments are provided for each of the required functions and four raceway systems are provided, one for each redundant set of cables. Markings on the drawings consist of color coded identificaton of the devices and routing, with a different color used for each redundant system. Fire barriers between cable trays are shown on the drawings.

Additional precautions taken to prevent an electrical cable fire from involving cables of more than one redundant system, include qualifying all cable insulations to the requirements of the ASTM Vertical Flame Test and the Consolidated Edison Company Vertical Flame Test and Bon-Fire Test, limitation of combustible materials in the vicinity of cable raceways.

DRAWING LIST

All drawings are prefixed with 9321-F-:

UE&C Dwg. No.	Rev.	Date	Title
30583	6	03/06/73	Cable Tray Plan Containment Building North Half
30633	12	12/19/75	Electrical Penetration & Cable Trays, EL. 46'-0" Sheet 1
30673	4	12/19/75	Electrical Penetrations & Cable Trays, Elevation & Details, Sheet 4
30763	8	08/14/73	Conduit Layout, Containment Building, EL. 68'-0", North Half
31413	7	12/19/75	Cable Tray Sections Containment Building EL. 46'-0"
33173	7	12/19/75	Conduit & Tray Conn. Scheme Containment Building, Sheet 2
33183	6	12/19/75	Conduit & Tray Conn. Scheme Containment Building, Sheet 3
33203	9	12/17/75	Conduit & Tray Conn. Scheme Containment Building, Sheet 1
70253	6	12/12/75	Primary Plant Instrument Piping and Supports - Sheet 1 Instrumentation
70513	4	12/12/75	Transmitter Racks Piping Arrangement - Sheet 4 Instrumentation

STAFF POSITION P7

The reactor coolant pump oil collection system should be improved where required to provide capability for collecting leakage from the following points: flanged connections; drain plugs; fill points; upper and lower reservoirs; sight glasses; lift pump; external oil cooler. The leakage should be collected and drained to a closed container.

Response

The oil splash shields and drip pans which have already been added to the pumps will protect the most vulnerable areas of the pumps. The Authority believes that the next logical step is not the addition of more shields and drip pans for collection, but rather significant improvements in the design of the lubrication system to reduce the potential for leakage. The Authority is actively investigating the latter concept to determine if it is a viable course of action. If the determination is made that leakage can not be reduced, then the leakage will be drained to a closed container.

STAFF POSITION P8

Manual hose stations should be provided inside containment for suppressing fires that may occur. Sufficient hose outlets, lengths of hose, and capacity should be provided to reach all areas containing significant quantities of electrical cables in trays and the reactor coolant pump areas with an effective fire fighting hose stream.

Response

The Power Authority plans to install a demineralized water header in the containment. We will evaluate this design to determine the feasability that manual hose stations be provided to reach all areas containing electrical cables in trays for safe shutdown and the reactor coolant pump areas with an effective fire fighting hose stream.

STAFF POSITION P9

Existing carbon dioxide portable extinguishers may not be effective in extinguishing deep-seated fires in wiring or paper combustibules in the control room. To preclude having to use a manual fire hose in such a situation, a portable fire extinguisher with "A" rated extinguishing capability such as a water or halon 1211 type extinguisher, should be provided for the control room.

Response

The Power Authority will provide the control room with either a portable Halon 1211 or a water fire extinguisher.

STAFF POSITION P1

Closure of valves in the fire water flow path could result in loss of suppression water or delay in application of suppression water, potentially resulting in a larger fire. All valves in the fire water system should be locked, electrically supervised, or provided with tamper indication seals and periodic checks, for valves whose closure could cause loss of water to hose stations or sprinkler systems serving safety-related areas.

Response

The Power Authority will provide all those valves (except curb box valves),whose closure could cause loss of water to hose stations or sprinkler systems serving safety related areas, with either locks, tamper switches or seal wire. Any valves that have been sealed with wire will be checked on a periodic basis to ensure that the seal is intact.

STAFF POSITION P11

Section 8.5 of the "Review of Indian Point Station Fire Protection Program" is not clear as to the effects on safety-systems of water sprays resulting from cracks in fire water piping or inadvertent system operation. Shields should be provided to prevent water from significantly imparing the functions of safety-related equipment. Additionally, where new suppression systems or piping are installed, protection of safety systems from water spray or flooding damage due to suppression system failure or inadvertent operations should be provided.

Response

In the plant with the present fire water piping configurations, there is no possibility that the function of safety related equipment could be significantly imparied by water spray resulting from cracks in fire water piping or inadvertent system operation. This conditions is being considered in the design and installation of new fire water piping systems.

STAFF POSITION P[redacted]

Fire doors to safety-related areas should be locked, alarmed, or provided with a fire-sensitive release device if the door is left open.

Response

The Power Authority will provide all existing fire doors to safety related areas with either locks, alarms or a fire-sensitive release device if the door is left open.

STAFF POSITION P

A windowless metal door should be provided in the doorway providing access to the volume control tank hydrogen storage bottles in the temporary contractor assembly area. Additionally the temporary contractor assembly structure should be removed.

Response

The Power Authority will provide a solid metal (no openings, windows or louvers) door and frame in the Primary Auxiliary Building elevation 55' by the hydrogen bottle storage area. The temporary contractors assembly structure will be removed when administration building is completed.

STAFF POSITION 14 Switchgear Room Separation

Provide the results of a study which describe the separation between redundant auxiliary feedwater pump, charging pump, safety injection pump and service water pump cables within the switchgear room. Plan view drawings should be included which show the horizontal cable separation. Barriers should be provided between redundant cables of these systems to protect one set of cables from a fire in the redundant set where they are located vertically over one another or where there is less than three feet horizontal separation. The charging pumps and the safety injection pumps may be considered redundant to each other in the consideration of preserving at least one set of the equipment necessary for the functions of decay heat removal, reactor water makeup and boration for fires in this area. If the safety injection pumps are to be used and the pump head is insufficient to inject water at normal operating pressure, the capability to depressurize to allow injection should also be protected as described above.

Response

A detailed study of the auxiliary feedwater pump charging pump and service water pumps demonstrate that with respect to the power cables there is sufficient separation between redundant components and their associated cables to preclude total loss of a function in the event of a fire.

The following drawings are enclosed for your information:

9321-F-30563
9321-F-30593
9321-F-30623
9321-F-30893
9321-F-31003
9321-F-31073
9321-F-31483
9321-F-31493
9321-F-31583

The basis for this conclusion is as follows:

(a) The two redundant motor drive auxiliary boiler feedwater pump power cables are routed through independent paths from the auxiliary feedwater pump building to the 480 volt switchgear in the 15 foot elevation of the control building. The cable for 31 ABFP runs underground inside conduit anchored in concrete for its entire length. The cable for 33 ABFP is above ground and is routed in cable tray through the upper electrical tunnel into the 480 volt switchgear.

There is also a third redundant steam driven auxiliary boiler feedwater pump that can be operated upon loss of electrical power to the motor driven pumps.

(b) There are three charging pumps each located in a separate cubicle. Only one pump is required for safe shutdown.

Power cables for each of the pumps are routed through separate conduit into the electrical cable tunnels. Cables for 32 charging pump run in the lower electrical tunnel while cables for 31 and 33 charging pumps run in the upper electrical tunnel.

The cables for 31 and 32 charging pump never run vertically over one another nor are they closer than three feet horizontally.

(c) Power cables for the six service water pumps are routed separately in underground conduit, anchored in cement, from the pump location at the intake structure to the 480 volt switchgear in the 15 foot elevation in the control building.

In addition, backup service water pumps located in the discharge canal have the power cables run in underground conduit through completely different route.

We are presently investigating the run of the control cables for the above pumps. This information will be forwarded to you as soon as possible.

STAFF POSITION 15 Cable Spreading Room

Modifications should be made in the cable spreading room to protect against loss of redundant safe shutdown instrumentation and against the loss of control of redundant diesel generators and the control of the diesel bus breakers from both the control room and local control stations. This could be accomplished by the installation of a sprinkler system in the cable spreading room.

If a CO_2 system is chosen to protect the cable spreading room in lieu of the above described sprinkler system, the following should also be provided:

1. The sprinkler system in the cable tunnels should be extended toward the cable spreading area to cover the cable to the point where cables enter the cable spreading room from the switchgear room below, and

2. Modifications to the safe shutdown instrumentation (pressurizer pressure and level and steam generator level) and to the 31 diesel generator control system should be made to assure that at least one channel of the instrumentation and emergency power to safe shutdown loads is independent of a damaging cable spreading room fire.

Response

In order to comply with the NRC requirements, we will have to re-evaluate our present proposed design of protecting the cable spreading room. This will require further detailed studies and subsequently the new scope of work and the schedule for implementation will be established.

STAFF POSITION

Provide smoke detectors alarming in the control room in the following locations contianing safety-related equipment: charging pump rooms; residual heat removal pump rooms; containment spray pump room; component cooling water pump room; auxiliary feedwater pump room; corridor at elevation 55' of PAB; walk-in panel with charging pump controls in control room and in fire area 59A.

Response

Additional smoke detectors alarming in the Control Room will be provided for the locations containing safety-related equipment; charging pump rooms; component cooling water pump rooms; auxiliary feed water pump room; corridor at elevation 55' of PAB wall panel with charging pump controls in Control Room and in fire area 59A.

STAFF POSITION

To prevent loss of both automatic and back-up manual fire suppression capability for the electrical tunnel from a single piping break, install an additional post-indicator valve on the fire underground. The valve should be located between the connections for the electrical tunnel sprinklers and the east control building hose standpipe.

Response

The post indicator valve in questions has been in existence in the yard piping system since the plant was constructed. Although it is not shown on the present drawings, the drawings will be revised to include this post indicator valve.

STAFF POSITION P1

Provide the following modifications to the existing fire detection systems in the safety-related areas:

a. A backup power supply for all portions of the systems upon loss of normal AC power.

b. Electrical supervision on all wiring in the system which actuates the electrical tunnel sprinklers, and on alarm circuits for the smoke detection system in the cable spreading room and the switchgear room. This supervision should alarm for opens, shorts and grounds which will affect operation of the system and which are not already detectable by normal operation of the system.

Response

a. Presently all fire detection system for safety related areas are powered by emergency power except the smoke detection system in the cable spreading and switchgear rooms which receives its power from the control room lighting panel. The Power Authority feels that the lighting panel power supply is acceptable since, following a blackout, the lighting circuits are manually restored to the emergency bus within reasonably short time period (approximately 10 minutes).

b. The Power Authority will provide electrical supervision on all wiring in the fire detection systems which activate electrical tunnel sprinklers, and smoke detection system in the cable spreading and switchgear rooms to detect opens, shorts and grounds which will affect operation of the system and which are not already detectable by normal operation of the system.

STAFF POSITION Yark Loop

P19. a Identify the number and locations of the hose houses proposed for Unit 3 Yark Loop. There should be a minimum of five (5) hose house suitably located so as to provide ready access from all safety-related areas of the plant. At least one hose house should be located at either hydrant #35 or #36 within the interior yard area.

Response

A standard hose house shall be available to each of the (13) hydrants and the hose header at the fire pumps.

The locations of the hydrants are shown on the Fire Protection Yard piping arangement drawing No. MO95 attached.

P19. b In order that suitable fire fighting capability will be provided, each exterior hose house should contain at least the following equipment:

200' - 2 ½" hose
200' - 1 ½" hose
Hose to have N.H. thread

1 - 2 ½" x 1 ½ x 1 ½" Gated Wye
1 - 2 ½" Gate valve
1 - 2 ½" Adjustible pattern fog nozzle with ball type shut off
2 - 1 ½" Adjustible pattern fog nozzles with ball type shut off
1 - Forcible entry tool (Hallican type or equivalent)
2 - Hose and ladder straps
4 - Universal spanner wrenches (2-2 ½" x 2-1 ½")
4 - Spare hose gaskets (2-2 ½" x 2-1 ½")
1 - Adjustible hydrant wrench
1 - Portable hand light (7 ½ volt)

Response

The Power Authority agress to provide each exterior hose house with at least that equipment which has been recommended.

P19. c All yard hydrants serving safety-related areas should be winterized annually in the fall of the year to insure that no water remains in the hydrant barrel or at the valve seat.

Response

The Power Authority agrees to winterize all yard hyrdants annually which serve safety related areas.

P19. d All fire hose, both 2 ½" and 1 ½" interior and exterior , should be provided wiht national standard fire hose thread to isnure compatibility with off site fire suppression forces.

Response

The Power Authority agrees to use national standard thread on all 2 ½" and 1 ½" interior and exterior fire hose to ensure compatability with off-site fire supression forces. Nozzles, wyes, gate valves, etc. will also have national standard thread. Existing interior 1 1/3" fire hose will be replaced to meet the above requirements.

P19. e All exterior fire hydrants and post indicator valves should be adequately barricaded to prevent vehicular impact damage.

During present construction work, hydrants and PIV's should be temporarily barricaded with suitable material to provide the above protection.

Response

The Power Authority agrees to adequately barricade all exterior fire hydrants and post indicator valves. During construction work, temporary barricades will be provided until permanent barricades can be installed.

P19. f In designing the location of post indicator valves adequate attention should be given to insure that clusters of valves are suitably spaced to permit operation of the valve operating wrench without obstruction caused by other valves or by barricades.

Response

Adequate clearances will be considered in designing the PIV locations to avoid obstruction of the operating wrench by other valves or by barricades.

P19. g All post indicator valves serving fire protection water supply to safety-related areas should be suitably tagged wth permanent tags indicating clearly the area that the valve controls.

Response

The Power Authority agrees to identify all post indicator valves servicing fire protection water supplies to safety related areas with permanent tags indicating clearly the areas that the valve controls.

STAFF POSITION Manual Fire Fighting Equipment

P20. a To provide adequate manual fire fighting capability for the overhead cable trays in the cable spreading room. A 20' electrically safe extension ladder should be provided in the cable spreading room clearly identified "for fire fighting use, not to be removed from the room."

Response

The Power Authority will provide a twenty (20) foot electrically safe extension ladder in the cable spreading room and clearly identify the ladder for fire fighting use, not to be removed from the room.

P20. b The following fire fighting equipment should be provided in either a suitable central location or at suitable strategic locations serving safety-related areas throughout the plant:

1. Protective clothing for 10 fire brigade members consiting of turnout coats, boots, helmets and gloves.

2. Portable smoke removal equipment, at least 3, with a total capability of removal of smoke at a rate of 15,000-20,000 cubic feet per minute.

3. Self-contained air breathing equipment for ten(10) fire brigade members. Each S.C.B.A. should have at least two (2) spare air cylinders.

   Additionally a sufficient recharge capability should be provided to maintain a breathing air supply for ten (10) men for a six (6) hour period at a rate of three (3) ½ hour air cylinders per hour.

4. Ten (10) portable hand lights (7 ½ volt)

5. Spare fire fighting hose, nozzles and other equipment to supplement the interior stand-pipes and the exterior hose house equipment.

6. Portable radio sets available for fire brigade use.

Response

The Power Authority agrees to provide all the recommended fire fighting equipment in either a suitable central location or at suitable strategic locations serving safety related areas.

P20. c Each interior standpipe location should be provided with a suitable universal hose spanner wrench and with a wrench designed to provide ease in operation of the standpipe control valve.

Response

The Power Authority agrees to provide each interior standpipe location with a suitable universal hose spanner wrench and with a wrench designed to provide ease in operation of the standpipe control valve.

STAFF POSITION P2[redacted] Fire Brigade [redacted]

Measure should be taken to form a fire brigade consisting of five (5) members, on all shifts, for unit 3 site, independent of the fire brigade at Consolidated Edison's Units 1 and 2.

Response

The site fire brigade is presently constructed of Power Authority employees and supplemented by Con Edison employees from Indian Points 1 and 2. This meets requirements of the Indian Point 3 Technical specifications.

A program for establishing, equipping and training a Power Authority, Indian Point 3, fire brigade is presently being developed. The Authority will upon completion of this program establish a five (5) member fire brigade, on all shifts, independent of the fire brigade from Con Edison units 1 and 2.

The proposed Power Authority fire brigade will consist of non-essential watch personnel, members of the plant staff and members of the security force.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MEMORANDUM FOR: TERA Corp.

FROM: US NRC/TIDC/Distribution Services Branch

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POWER AUTHORITY OF THE STATE OF NEW YORK

10 COLUMBUS CIRCLE NEW YORK, N. Y. 10019

(212) 397-6200

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CONTROLLER

October 2, 1978
IPO-160

Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Albert Schwencer, Chief
Operating Reactor Branch No. 1

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286

Dear Mr. Schwencer:

By letter dated June 9, 1978 (IPO-116) the Authority expected that responses to your letters of September 14 and October 27, 1977 relative to lamellar tearing of steam generator and reactor coolant pump supports could be submitted by September 29, 1978. As a consequence of unanticipated delays in obtaining the archive information necessary for our NSSS vendor to complete this study, the Authority now anticipates that it can submit the requested information by October 30, 1978.

Very truly yours,

Paul J. Early
Assistant Chief Engineer-Projects

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POWER AUTHORITY OF THE STATE OF NEW YORK
10 COLUMBUS CIRCLE NEW YORK, N. Y. 10019
(212) 397-6200

September 29, 1978
IPO-158

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Albert Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors

Subject: Indian Point 3 Nuclear Power Plant
Diesel Generator Alarm and Control Circuitry
Docket No. 50-286

Dear Sir:

In response to the questions raised by your letter of August 30, 1978, the Authority submits the following answers:

(1) The wording on the annunciators alarmed by the diesel lockout relay will be "DG 31 Auto Start Defeated", "DG 32 Auto Start Defeated" and "DG 33 Auto Start Defeated".

(2) The "Safeguards Equipment Locked Open" Annunciator does not have reflash capability.

(3) The annunciator will remain in the alarmed condition until the abnormal condition is cleared up.

(4) The loss of DG control will actuate the same annunciators as the DG lockout relay alarm described in Item 1 above.

The diesel control switch presently brings up the safeguards equipment locked open alarm when the switch is not in the "Auto" position. Additionally, the alarm circuitry will be modified so

that when the DG control switch is not in an auto position, it will also bring up the same alarms as loss of DG power and DG lockout relay alarm described above.

Very truly yours,

George T. Berry

George T. Berry
General Manager