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March 30, 1995

Re: Indian Point Unit No. 2
Docket No. 50-247

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

SUBJECT: Technical Exemption from the Requirements of 10 CFR 50,
Appendix R, for Fire Zone 74A, Electrical Penetration Area

- REFERENCES:
- 1) NRC Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System...", dated June 24, 1992
 - 2) Letter dated July 24, 1992, S.B. Bram to Document Control Desk, Response to NRC Bulletin 92-01
 - 3) NRC Bulletin 92-01, Supplement 1, "Failure of Thermo-Lag...", dated August 28, 1992
 - 4) Letter dated September 30, 1992, S.B. Bram to Document Control Desk, Response to NRC Bulletin 92-01, Supplement 1
 - 5) Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers", dated December 17, 1992
 - 6) Letter dated April 16, 1993, S.B. Bram to Document Control Desk, Response to Generic Letter 92-08
 - 7) Letter dated December 22, 1993, L.J. Callan to S.B. Bram, "Request for Additional Information Regarding Generic Letter 92-08..."
 - 8) Letter dated February 11, 1994, S.B. Bram to Document Control Desk, Response to Request for Additional Information
 - 9) Letter dated September 20, 1994, R.P. Zimmerman to S.E. Quinn, "Followup to the Request for Additional Information Regarding Generic Letter 92-08..."
 - 10) Letter dated December 19, 1994, S.E. Quinn to Document Control Desk, Response to the Followup

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In accordance with 10 CFR 50.12(a), this letter submits a request for an exemption from the technical requirements of 10 CFR 50, Appendix R, section III.G for fire zone 74A, Electrical Penetration Area (E-Pen). Compliance with this section of Appendix R is required by 10 CFR 50.48(b). The attachment to this letter includes the Exemption Request and a report entitled "Appendix R Evaluation of Penetration H20" which provides the technical justification and contains the information requested in Reference 9 to support the request.

The E-Pen contains cabling associated with safe shutdown equipment and instrumentation. In general, redundant cables are not separated by a horizontal distance of more than 20 feet with no intervening combustibles, as cable insulation has conservatively been considered by the NRC to be an intervening combustible regardless of the fire-resistant nature of the insulation material. In 1983, Con Edison provided an alternate safe shutdown system (ASSS) that is generally independent of this zone and its area. Although not originally considered necessary for process monitoring of safe shutdown, Con Edison installed a source range flux monitor and reactor coolant hot leg temperature and cold leg temperature instrumentation as part of the ASSS after discussions with the NRC. However, cables for these alternate instruments are routed a short distance through the E-Pen, the same zone through which are routed cables for the redundant instruments supplied by normal plant power sources. These alternate instrument cables also are not separated from their redundant counterpart cables by a horizontal distance of more than 20 feet with no intervening combustibles (if cable insulation is considered an intervening combustible), although there are multiple channels available at separate penetrations in the E-Pen. An automatic fire suppression system is also not provided in the zone.

With alternate instrumentation installed and separation and fire suppression requirements not met, to comply with the literal requirements of section III.G.2 of Appendix R a three-hour fire rated barrier was constructed to enclose these ASSS instrument cables that are routed within the E-Pen. This barrier consists of a metal frame attached to the containment wall at penetration H20 to which Thermo-Lag panels are fastened, and a conduit exiting the top of the enclosure is protected with Thermo-Lag pre-formed conduit shapes. Details concerning this enclosure have been provided in References 2, 4, 6 and 8. Beginning with Reference 1 and continuing with References 3 and 5, the NRC has found the Thermo-Lag to be unacceptable for use as a three-hour fire rated material. A one hour fire watch tour using remote television surveillance in conjunction with existing fire detection instruments is ongoing as a compensatory measure.

In Reference 10, Con Edison committed to remove the Thermo-Lag material from the penetration H20 enclosure and conduit. We also indicated our intent to submit an exemption request. The exemption request provided herein and the attached evaluation demonstrate that due to the fire resistant barrier nature of the cables themselves, the low

combustible loading in the vicinity of penetration H20, the type of fire postulated, the fire detection existing in the zone, and the expected response for fire suppression, an adequate level of fire protection exists in the E-Pen such that an enclosure of any kind is not necessary, although at the time Reference 10 was prepared a non-fire rated enclosure was considered. The removal of the Thermo-Lag will result in the deletion of fire zone 74B and fire area Q. Accordingly, the cables for the ASSS instruments of source range flux monitor, reactor coolant hot leg temperature, and reactor coolant cold leg temperature will be located in fire zone 74A, fire area A, the same zone and area as the redundant cables for the same parameters. As indicated in Reference 10, the Thermo-Lag will be removed by the end of the next refueling outage currently scheduled to begin in early 1997.

Should you or your staff have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety & Licensing.

Very truly yours,



Attachment

cc: Mr. Thomas T. Martin
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ATTACHMENT

REQUEST FOR A TECHNICAL EXEMPTION FROM THE
REQUIREMENTS OF 10 CFR 50, APPENDIX R
FOR FIRE ZONE 74A, ELECTRICAL PENETRATION AREA

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
MARCH, 1995

EXEMPTION REQUEST

In accordance with the requirements of 10 CFR 50.12(a), Con Edison requests the following exemption from the requirements of 10 CFR 50, Appendix R in order to allow the elimination of the Thermo-Lag encapsulation around Penetration H-20:

Appendix R Paragraph:

III.G.2

Description of Exemption:

Separation of redundant trains by a 3-hour rated barrier, 20 feet with no intervening combustibles, or a 1-hour rated barrier with automatic fire suppression for the T-hot, T-cold, and source range flux instrumentation cables of the Alternate Safe Shutdown System(ASSS).

Fire Zone:

74A, Electrical Penetration Area

Area Description:

The Electrical Penetration area (E-Pen) is located at elevation 46 feet and is generally enclosed by three foot or thicker concrete walls and floor. The east wall is constructed of concrete or metal sandwich with penetrations sealed with silicone foam to provide a fire stop, and a normally closed steel door provides access to the E-Pen. The ceiling is 6 inch concrete with built-up roofing and an equipment hatch with no fire zones above. The zone is curved with a minimum width of approximately 14 feet, a length of about 80 feet, and a 20 foot ceiling. The room is generally quite large and uncongested with easy access to all locations. The zone includes a set of cable trays along the outer wall and a small set of splice trays along the inner wall at the penetrations. Cables from the containment penetrations enter trays and cross to the opposite wall where they exit through the floor or remain in trays to exit the end of the room. The cable routing is generally open, out, and away from the penetrations.

Penetration H-20 is located in the top row, in the next to last column of penetrations near the back of the E-Pen. Since the cables travel from the back of the room forward, there are few cables at the end of the room where H-20 is located. The ASSS instrument cables are routed from penetration H-20 close in and up to the ceiling, in the opposite direction of other plant cables. In addition, the penetrations near H-20 do not carry many cables. Thus, the cable concentration near penetration H-20 is very low.

The attached Report No. 94111701 entitled; "Appendix R Evaluation Of Penetration H-20" has a description and accompanying photographs of penetration H-20 and the surrounding area.

EXEMPTION REQUEST

Safe Shutdown Capability:

Zone 74A contains cabling associated with equipment inside containment and instrumentation providing indication in the Central Control Room. The zone also contains control and instrument cables for the auxiliary feedwater system which is required for normal safe shutdown. However, in case of a fire that damages the normal control and instrument cables, this system would be operated locally, as directed by the safe shutdown procedure, using the ASSS in the auxiliary boiler feed pump room which is independent of zone 74A. The control cables for the atmospheric relief valves are also in this zone. However, these valves would only be required for hot shutdown and can be operated locally as directed by the safe shutdown procedure using the pneumatic control system that is independent of this zone. The only safe shutdown process monitoring instruments that could be used for a fire in this zone that disables normal plant process monitoring instruments are the T-hot, T-cold, and source range flux instrumentation of the ASSS. The cables for both the normal plant instruments and the ASSS instruments which monitor these parameters are located within Zone 74A. Con Edison considers the availability of T-hot, T-cold, and source range flux instrumentation to be an enhancement that is not essential for achieving safe shutdown. Interim operation without this instrumentation was allowed by the NRC based on its non-essential back up nature.

Fire Hazard Analysis:

The only combustible material in the E-Pen is the electrical cabling that is routed to electrical penetrations and a small number of cables that pass through to the auxiliary boiler feed pump room. A large part of the cabling is asbestos jacketed cable and the balance is IEEE-383 qualified cable thus making the Indian Point 2 cables extremely fire resistant. Further details on the fire resistance characteristics of the Indian Point 2 cables are discussed in the attached report. Because of the cable characteristics, if cable insulation were assumed to not be a combustible, the fire load in Zone 74A would be negligible.

Cable trays in the E-Pen are arranged in two stacks, a large stack of trays along the outer wall of the zone and a smaller set of splice trays along the inner wall. There are several cross-overs at about eight or nine feet above the floor between the two sets of cable trays. There are no other combustible materials installed in the zone. The quantity of cables in the vicinity of penetration H-20 is very low. Because of the fire resistance of the cables and the low concentration of cables near H-20, the fire hazard near H-20 is very low. Additionally, introduction of transient combustibles is of low potential. Transients would only be brought into the zone to support repairs or modifications and would be subject to administrative controls. The maximum amount of transient combustibles is expected to be quite small, and would not conceivably be more than a gallon of cleaning solvent. There is no traffic through the area. The only traffic into the zone would be to perform the work discussed above, to conduct surveillance tests, to conduct routine operator inspection rounds, and to conduct routine security rounds.

EXEMPTION REQUEST

The attached report discusses a bounding quantitative fire effects thermal analysis of the Indian Point 2 cables in this zone. The results of the analysis show that the exposure fire heat flux does not exceed the critical values for cable ignition. Thus, damage to the electrical cables in the E-Pen would not result from the bounding fire scenario postulated.

The E-Pen is equipped with automatic fixed early warning ionization detectors which alarm in the Central Control Room, allowing rapid fire brigade response. This selection is appropriate because potential cable fires are slow burning, highly smoke-generating, and low flaming type fires which will be detected in their incipient stages by this system. The area is accessible through the piping penetration area either from the electrical and piping tunnel of the primary auxiliary building or from the fan house after passing through elevation 80 feet of the primary auxiliary building. This zone could be reached in approximately 10 minutes by the fire brigade who have been trained in the pre-fire planning for this zone. A hose station is located nearby in the Piping Penetration Area and portable extinguishers are available throughout that zone.

Summary of Basis for Exemption:

The attached report discusses various aspects of the T-hot, T-cold, source range flux instrumentation and the Thermo-Lag encapsulated penetration H-20, and documents a defense-in-depth for the safe shutdown of Indian Point 2 with respect to a fire outside or within the E-Pen. The defense-in-depth incorporated into the Indian Point 2 safe shutdown systems shows that a further degree of protection for penetration H-20 and the ASSS T-hot, T-cold, and source range flux instrument cables is not warranted. The key aspects of defense-in-depth are the non-essential nature of the instrument cables being protected, the type of fire hazard in the zone, the low fire hazard in the vicinity of H-20 especially considering the fire resistant characteristics of plant cables, and the early detection and extinguishment of a potential fire.

The ASSS T-hot, T-cold, and source range flux instrumentation was installed as an enhancement to the minimum process information necessary for safe shutdown operation. The NRC has previously allowed interim operation without the instrumentation and the earlier justification for interim operation is still valid. It is important to note that Con Edison is only removing the Thermo-Lag in the E-Pen and this instrumentation will remain available as part of the ASSS.

Penetration H-20 is located in an area where cable insulation is the only potential combustible hazard. The only items located near H-20 are rugged, fire resistant cables. There is a very low fire load in the immediate vicinity of H-20 and no significant transient combustibles are expected during plant operation. Access to the area is under strict administrative controls at all times. A bounding quantitative fire effects thermal analysis identified no cable damage. For fires in other plant fire zones outside of the E-Pen, the ASSS instrument cables in H-20 would be unaffected altogether.

EXEMPTION REQUEST

If an E-Pen cable fire were to occur, it would be a slow burning, highly smoke-generating fire. The automatic ionization detection present in the E-Pen would quickly alarm in the Central Control Room. A fire would be discovered in its initial stages and the Fire Brigade could promptly respond with manual fire fighting equipment. The Fire Brigade training and the pre-fire planning significantly enhance the ability to rapidly extinguish such a fire.

The defense-in-depth provided for safe shutdown of Indian Point Unit 2 is sufficient basis for an exemption to the Appendix R requirement to provide a high degree of protection to the ASSS T-hot, T-cold, and source range flux instrument cables in the E-Pen. Elimination of the Thermo-Lag that encapsulates penetration H-20 will not result in any unacceptable safety related consequences.