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December 15, 1982
IPN-82-81

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

Attention: Mr. Steven A. Varga, Chief
Operating Reactor Branch No. 1
Division of Licensing

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
Appendix R Impact on Indian Point
Probabilistic Safety Study (IPPSS).

Dear Mr. Varga:

By letter dated March 5, 1982, the Power Authority submitted the Indian Point Probabilistic Safety Study (IPPSS) to the Commission. In the IPPSS, fire initiated events contributed significantly to both core melt frequency and release category 2RW. The fire analysis did not incorporate the proposed Appendix R modification for Indian Point 3.

On July 1, 1982, the Power Authority submitted two proposals for its Appendix R modification -- fire barriers or alternate cabling. After discussions with the Commission, the Authority has decided, as indicated in a letter dated October 29, 1982, that the "alternate cabling system" was the preferred approach. This letter addresses two issues relating to fire-related risk: (1) correction in the IPPSS base case fire risk, and (2) a quantification of the risk reduction due to the installation of the alternate cabling system.

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I. Change to Base Case Fire Risk

At the request of the Sandia National Laboratories review team, a reexamination was made of the sequence involving failure of the Component Cooling System (an internal event) causing a reactor coolant pump seal LOCA. This reanalysis did not result in a significant change in the frequency of category 2RW or in risk. The Power Authority, however, instructed its consultants to also review all external events with regard to this system's failure or incapacity. This review led to a correction in the base case fire risk which was discussed at the Albuquerque meeting on October 13, 1982 and documented in the minutes of that meeting by NRC staff on October 22, 1982. A correction to the frequency of fire propagation for the base case is shown in the attached Table 1.

II. Reduction in Risk Due to Installation of Alternate Cabling System

In Indian Point Unit 3, the major contributors to fire related risks are fires originating in two zones: the switchgear room and electrical tunnel entrance area. Accordingly, an alternate cabling system was evaluated which allows routing of power to vital plant components without passing through any of the critical fire locations.

The modification involves using the nonsafety switchgears 312 and 313 located in the turbine building as an alternate power source for one Component Cooling System (CCS) pump, one charging pump, one service water pump and the instrumentation cabinet located in the penetration area. The source of the electrical power supply to the switchgears is the 138 KV or the 13.8 KV feed from the Buchanan substation. Transfer switches will be installed for the CCS pump and charging pump. The backup pump for the Service Water System will be connected directly to the switchgear without a transfer switch. An alternate power cable will feed the instrumentation isolation cabinet.

Manual switches in the instrumentation isolation cabinet isolate the instrumentation circuitry from the cable spreading room and control room. The application of these switches reactivates the wide range steam generator level indicators and the pressurizer pressure and level indicators in the auxiliary feedwater pump room and the channels of pressurizer pressure and level outside the charging pump room.

In the case of a fire in the switchgear room or electrical tunnel entrance area, the operators would reactivate at least one component cooling pump within one-half hour of loss of

all CCS pumps to prevent seal failure. If vital instrumentation were also lost, the operators would activate local instrumentation from the instrumentation isolation cabinet. They would isolate the instrumentation from the control room by applying switches at the cabinet (in the penetrations area). They could then follow the vital parameters at two locations: the auxiliary feedwater pump room and the charging pump area. This procedure would also be followed in the event vital instrumentation is lost during a cable spreading room fire.

Core cooling would be achieved by running an auxiliary feedwater pump. In the case of a switchgear room fire, the turbine-driven pump can be controlled from the control room. The Appendix R study had identified that the power cable for the steam supply valve is coupled to cables in the switchgear room. However, the resultant effect of postulated interactions was determined not to impair the turbine-driven pump operability. In the case of an electrical tunnel entrance fire, the turbine-driven pump can be controlled at the pump location. Also, in the latter case, the power cable for one motor-driven auxiliary pump would remain available. With regard to the analysis of the alternate cabling system, operator error would be the dominant cause of the unavailability of this new system.

The modification mainly affects those fire scenarios that originate in the electrical tunnel, switchgear room or cable spreading room where many vital components may be affected. The bottom half of Table I shows the overall reduction in risk with the alternate cabling system modification. The modification reduces the contribution from the electrical tunnel entrance area, switchgear room and cable spreading room.

The foregoing risk, frequency and consequence data were prepared by our IPPSS consultants using the same methodologies and procedures employed in IPPSS. A supplement to the IPPSS detailing items I and II above will be forwarded in the near future.

If you have any questions, please feel free to contact me.

Very truly yours,

J. P. Bayne
Executive Vice President
Nuclear Generation

Att.

cc: attached

cc: J. W. Hickman, Supervisor
Nuclear Fuel Cycle Systems
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TABLE 1. CHARACTERISTIC VALUES OF THE FREQUENCIES OF RELEASE CATEGORIES AND CORE MELT DUE TO FIRE AFTER THE APPENDIX R MODIFICATION TO INDIAN POINT 3

Description	Percentile	Annual Frequency (1)	
		Core Melt	2RW
Base Case	Mean	1.0-4	9.6-5
Appendix R Fix(2)	Mean	1.4-5	6.8-6

Notes:
1. Exponential notation is indicated in abbreviated form; i.e., 5.5-6 = 5.5×10^{-6}.
2. Alternate feeds and transfer switches for one backup SWS pump, one CCS pump and one charging pump and power supply of vital instrumentation.