ATTACHMENT A

Technical Specification
Page Revisions

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
September, 1982

TSTECH

requirements of 3.3.B-1 within the time period specified, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures. If the requirements of 3.3.B-1 are not satisfied within an additional 48 hours, the reactor shall be placed in the cold shutdown condition utilizing normal operating procedures. *

a. Fan cooler unit 23, 24, or 25 may be non-operable during normal reactor operation for a period not to exceed 24 hours, provided both containment spray pumps are demonstrated to be operable.

OR

Fan cooler unit 21 or 22 may be non-operable during normal reactor operation for a period not to exceed 7 days provided both containment spray pumps are demonstrated daily to be operable.

b. One containment spray pump may be out of service during normal reactor operation, for a period not to exceed 24 hours, provided the five fan cooler units are operable and the remaining containment spray pump is demonstrated to be operable.

c. Any valve required for the functioning of the system during and following accident condition may be inoperable provided it is restored to operable status within 24 hours and all valves in the system that provide the duplicate function are demonstrated to be operable.

C. Isolation Valve Seal Water System (IVSWS)

1. The reactor shall not be brought above cold shutdown unless the following requirements are met:

a. The IVSWS shall be operable.

b. The IVSW tank shall be maintained at a minimum pressure of 52 psig and contain a minimum of 144 gallons of water.

*One time only exemption for fan cooler unit 24, the 48 hour action statement for the hot shutdown condition may be extended for a period of 3 days ending 11:59 PM September 7, 1982.

ATTACHMENT B

Safety Assessment

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Safety Assessment

The proposed changes, contained in Attachment A to this Application, revise the technical specifications to permit, on a one time only basis, an additional three day extension to the hot shutdown limitation specified in Technical Specification 3.3.B.2 for fan cooler unit no. 24. This change allowed the plant to remain in hot shutdown until repairs were completed on fan cooler unit no. 24, which was out of service due to a fan bearing/coupling failure. The requested additional time precluded an unwarranted cooldown and cycling of the reactor coolant system and provided sufficient time for repair of the fan.

An evaulation of maintaining the reactor at hot shutdown with one fan cooler unit out of service (FCU No. 24) beyond the forty-eight (48) hours permitted by Technical Specification 3.3.B.2 was performed. Since the energy sources, consistent with the reactor at hot shutdown after forty-eight (48) hours are reduced (versus the FSAR analysis for the design basis event of a large break LOCA at a power level of 3216 MW_{th}), significant margin in containment cooling would be available.

Even with FCU 24 out of service and assuming the most limiting single failure of diesel generator 21, one containment spray train and two FCU's will still be available for containment cooling (versus the FSAR analysis assumption of one spray train and three FCU's). Conservative calculations indicate that the containment design pressure of 47 psig will not be exceeded if one spray train and two FCU's are available. Since we maintained the plant at hot shutdown, this assessment is certainly applicable and conservative. The methodology for the calculations is described in Appendix 1.

Our experience with the fan cooler unit fans has been excellent. Only twice before have fan failures occurred. Our experience with diesel generator testing has also been excellent. In addition, a cold shutdown would extend the estimated offline time by four to five days beyond the extension time being requested herein (as opposed to staying at hot shutdown). To restore the unit to power at this point in the fuel cycle we would need a lengthy boron dilution and generate a large volume of liquid waste. Also, time and man-rem exposure would need to be expended to perform RHR check valve and containment leakage testing required to bring the plant out of cold shutdown. Furthermore, based on the results of the Indian Point Probabilistic Safety Study (IPPSS), the impact of one inoperable fan cooler unit on risk is negligible, particularly in view of the plant's hot shutdown status.

Thus, from a practical as well as a technical point of view, maintaining the plant at hot shutdown until fan repairs are completed is the preferred mode of operation.

The proposed changes have been reviewed by the Station Nuclear Safety Committee and the Consolidated Edison Nuclear Facilities Safety Committee. Both committees concur that the proposed changes do not represent a significant hazards consideration and will not cause any change in the types or an increase in the amounts of effluents or any change in the authorized power level of the facility.

APPENDIX 1

CALCULATION METHODOLOGY

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APPENDIX 1

IP2 FSAR analysis for the limiting event (LOCA) with regard to containment integrity assumes three fan coolers and one containment spray operating 60 seconds into the event. This analysis was utilized to conservatively evaluate the effect of maintaining the reactor at hot shutdown, with fan cooler unit 24 (FCU #24) inoperable, beyond the 48 hours permitted by the Tech. Spec. Based on the Diesel/Containment Spray/Fan Cooler Unit configuration it can be concluded the most limiting single failure (of Diesel 21) results in two FCU's and one containment spray available, given FCU#24 inoperable).

Diesel	FCU	Containment Spray
21	21,22	21
22	23,(24)	
23	25	22

Since the energy sources, consistent with the reactor at 48 hours of hot shutdown, are significantly reduced (versus the design basis event of LOCA at a power level of 3216 MWT) significant margin in containment cooling would be available, and the following calculational results demonstrate this.

I. Effect of one Fan Cooler Unit inoperable on peak (blowdown) pressure:

The Indian Point Unit 2 containment pressure has been calculated not to exceed a peak pressure of 40 psig (versus the design value of 47 psig). This was based on the limiting (large break LOCA) transients as presented in the IP2 updated FSAR (Figure 14.3.5-2). These analyses are based on one spary pump and 3 fan cooler units starting at 60 seconds; however, the peak pressures are essentially unaffected by the operation of these systems. In particular the containment pressure response demonstrates an early peak pressure, with a rapid subsequent pressure decrease, due to the dominant (short term) factors. These are the mass and energy release due to the LOCA blowdown of the RCS coolant to containment, and the effect of the large containment free volume and containment structures (heat slabs). Of the limiting transients, only the smallest case analyzed (0.5 square foot break) demonstrated a peak containment pressure that occurred after containment spray and fan coolers were initiated (125 versus 60 seconds). For this case the peak containment pressure was 37 psig, and conservatively calculating the impact of one fan cooler unit inoperable the peak pressure would be increased by less than 0.2psi, to approximately 37.2 psig. The calculation is based on the containment pressure at 60 and 125 seconds, and one fan cooler unit capability at these respective pressures, in conjunction with the containment pressure versus internal energy (conservatively ignoring additional energy absorbing potential of the heat slabs).

II. Effect of one Fan Cooler Unit inoperable on long term pressure transient:

To address the longer term containment pressure transient, and to assess the effect of only two fan cooler units and one containment spray, a very conservative bounding case was postulated. The containment transient was assumed to result in a peak containment pressure of 40 psig, at 60 seconds, and it was further assumed the pressure did not decrease with time (this is an artificial and conservative assumption since, for a high peak pressure to occur early in time, the subsequent pressure decrease will be significant due to the effect of containment structures alone). It was then assumed that the potential energy absorbing contribution due to one fan cooler unit (as well as the benefit of heat slabs) was not available. The time for the containment pressure to rise to 47 psig was calculated (again using the containment pressure versus internal energy), resulting in an elapsed time to reach 47 psig in excess of 2200 seconds. The resultant decay heat (using the 3216 MW basis of the FSAR containment analysis vs license limit of 2758 MW) is 204×10^6 BTU/hr. This is less than the capability of 2 fan cooler units and one containment spray (in excess of 250×10^6 BTU/hr) - thus the pressure will be decreasing, and in fact not reach 47 psig

Finally, it should be noted that the above results contain the additional significant conservatism of 3216 MWT at the initiation of the event, versus 48 hours of shutdown (as well as 2758 vs 3216 MWT). Only considering the addition of the 48 hours of shutdown the decreased decay heat more than offsets the inoperable fan cooler over the times of interest. As an example, one fan cooler unit has a capability of 76×10^6 BTU/hr at containment design pressure of 47 psig. The decay heat is reduced by about the same amount at 10,000 seconds into the transient due to the 48 hr shutdown, while earlier in time the decay heat reduction is even more significant (e.g., about 220×10^6 BTU/hr at 1000 seconds). Additionally at 10,000 seconds, the decay heat is sufficiently low that only one FCU or one containment spray is adequate to maintain pressure below 47 psig.