

ATTACHMENT I TO IPN-89- 024

~~SAFETY EVALUATION OF~~
PROPOSED TECHNICAL SPECIFICATIONS
REGARDING RESIDUAL HEAT REMOVAL (RHR) PUMP OPERABILITY
DURING COLD SHUTDOWN WITH T_{AVG} ABOVE 140°F

New York Power Authority
Indian Point 3 Nuclear Power Plant
Docket No. 50-286
DPR-64

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3. LIMITING CONDITIONS FOR OPERATION

For the cases where no exception time is specified for inoperable components, this time is assumed to be zero.

3.1 REACTOR COOLANT SYSTEM

Applicability

Applies to the operating status of the Reactor Coolant System; operational components; heatup; cooldown; criticality; activity; chemistry and leakage.

Objective

To specify those limiting conditions for operation of the Reactor Coolant System which must be met to ensure safe reactor operation.

Specification

A. OPERATIONAL COMPONENTS

1. Coolant Pumps

- a. When a reduction is made in the boron concentration of the reactor coolant, at least one reactor coolant pump or one residual heat removal pump (connected to the Reactor Coolant System) shall be in operation.
- b. (1) When the reactor coolant system T_{avg} is greater than 350°F and electrical power is available to the reactor coolant pumps, and as permitted during special plant evolutions, at least one reactor coolant pump shall be in operation. All reactor coolant pumps may be de-energized for up to 1 hour provided no operations are permitted that would cause dilution of the reactor coolant system boron concentration, and core outlet temperature is maintained at least 10°F below saturation temperature.

(2) When the reactor is subcritical and reactor coolant system T_{avg} is greater than 350°F, control bank withdrawal shall be prohibited unless four reactor coolant pumps are operating.
- c. When the reactor coolant system T_{avg} is greater than 200°F and less than 350°F, and as permitted during special plant evolutions, at least one reactor coolant pump or one residual heat removal pump (connected to the Reactor Coolant System) shall be in operation. All reactor coolant pumps may be de-energized with RHR not in service for up to 1 hour provided no operations are permitted that would cause dilution of the reactor coolant system boron concentration, and core outlet temperature is maintained at least 10°F below saturation temperature.

3.1-1

- d. When the reactor coolant system T_{avg} is less than 200°F, but not in the refueling operation condition, and as permitted during special plant evolutions, at least one residual heat removal pump (connected to the Reactor Coolant System) shall be in operation. This RHR pump may be out of service for up to 1 hour provided no operations are permitted that would cause dilution of the reactor coolant system boron concentration, and core outlet temperature is maintained at least 10°F below saturation temperature.
- e. When the reactor is critical and above 2% rated power, except for natural circulation tests, at least two reactor coolant pumps shall be in operation.
- f. The reactor shall not be operated at power levels above 10% rated power with less than four (4) reactor coolant loops in operation.
- g. If the requirements of 3.1.A.1.e and 3.1.A.1.f. above cannot be satisfied, the reactor shall be brought to the hot shutdown condition within 1 hour.
- h. A reactor coolant pump (RCP) may not be started (or jogged) when the RCS cold leg temperature (T_{cold}) is at or below 326°F, with no other RCP's operating, unless RCS make up is not in excess of RCS losses, and one of the following requirements is met:

(1) The OPS is operable, steam generator pressure is not decreasing, and the temperature of each steam generator is less than or equal to the coldest T_{cold} ;

Or

(2) The OPS is operable, the temperature of the hottest steam generator exceeds the coldest T_{cold} by no more than 64°F, pressurizer level is at or below 75 percent, and T_{cold} is as per Figure 3.1.A-1;

Or

(3) The OPS is inoperable, steam generator pressure is not decreasing, the temperature of each steam generator is less than or equal to the coldest T_{cold} , pressurizer level is at or below 75 percent, and the RCS pressure does not exceed that given by Curve I on Fig. 3.1.A-2;

Or

(4) The OPS is inoperable, the temperature of the hottest steam generator exceeds the coldest T_{cold} by no more than 64°F, and pressurizer level and RCS pressure do not exceed the boundaries given on Fig. 3.1.A-4.

3.1-1a

i. Additional pumps may not be started (or jogged) unless the OPS is operable and the pressurizer level is not increasing.

(1) Specification 3.1.A.1.i above may be modified to allow the OPS inoperable, providing the temperature of each steam generator has remained less than or equal to the coldest T_{cold} since the first RCP start, pressurizer level is at or below 75 percent, and the RCS pressure does not exceed that given by Curve I on Fig. 3.1.A-2.

(2) Specification 3.1.A.1.i above may be further modified to allow the OPS inoperable and the temperature of the hottest steam generator to be no greater than 64°F higher than the coldest T_{cold} , provided that pressurizer level is at or below 75 percent and RCS pressure does not exceed that given by Curve II on Fig. 3.1.A-2.

j. Following the start of one or more RCP's and prior to reaching 326°F, the RCS pressure shall not exceed that given by Curves I and II on Fig. 3.1.A-3 as appropriate.

3.1-1b

ATTACHMENT II TO IPN-89-024

SAFETY EVALUATION OF
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REGARDING RESIDUAL HEAT REMOVAL (RHR) PUMP OPERABILITY
DURING COLD SHUTDOWN WITH T_{AVG} ABOVE 140° F

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**SAFETY EVALUATION OF
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Section I - Description of Change

This application for amendment to the Indian Point 3 (IP3) Technical Specifications seeks to revise Paragraph 3.1.A.1.d of Appendix A regarding residual heat removal (RHR) pump operability during the cold shutdown condition with T_{avg} above 140 °F. The change clarifies limiting conditions for operation of the Reactor Coolant System (RCS), ensuring consistency with existing specifications, and meeting the intent of Westinghouse Standard Technical Specifications (W STS).

Section II - Evaluation of Change

A letter from the Commission dated June 11, 1980 (Reference 7) requested all operating Pressurized Water Reactors (PWRs) to provide permanent long term assurance of redundant decay heat removal capability, and enclosed Model Technical Specifications (W STS) to be used as guidance. The Commission's review of Authority submittals dated July 6, 1983 (Reference 6) and December 3, 1984 (Reference 4) subsequently resulted in Amendment No. 53 (Reference 3) to the IP3 Operating License which included Technical Specifications 3.1.A.1 and 3.3.A.7.

Paragraphs 3.1.A.1.b through d provide Reactor Coolant Pump (RCP) and RHR Pump operating requirements during the conditions of hot and cold shutdown. Additionally, Paragraphs b and c allow for pump inoperability under stipulated conditions. The proposed change to Paragraph 3.1.A.1.d would grant a similar provision. The proposed change would allow the operating RHR pump to be out-of-service for up to one (1) hour provided no operations are permitted that would cause dilution of the RCS boron concentration, and core outlet temperature is maintained at least 10 °F below saturation temperature. The one hour allowed for the no pump running condition is not of sufficient duration to allow significant localized boron dilution due to stratification. Combined with the requirement for no operations that could cause dilution, the probability of exceeding shutdown margin in any region of the core is not significantly increased. Additionally, the requirement to maintain core exit temperature 10 °F below saturation provides sufficient margin to the onset of boiling, including time to restore cooling before boiling occurs in any part of the core. Moreover, the proposed change does not affect the operation of RCS/RHR temperature and flow instrumentation. The proposed change provides for flexibility consistent with existing

specifications, without compromising decay heat removal capability.

The "out-of-service" (O-O-S) condition is being defined as not in operation, but not necessarily inoperable. In accordance with Specification 3.3.A.7, two (2) RHR pumps are required operable during cold shutdown with T_{avg} above 140°F unless an alternate means of decay heat removal is available. A single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that an additional RHR loop be operable. Thus, should the operating pump be shutdown (O-O-S yet operable), Specification 3.3.A.7 is not violated and the proposed change would allow up to one hour to reinstate an RHR pump to operating status. This allows for the flexibility desired during pump turnover when the operating pump is shutdown and a short period of inoperability occurs between shutdown time and the time another pump is put into operation. Should, however, the operating pump become inoperable, the proposed change would require an RHR pump to be rendered in operation within the one hour period. At this point, one RHR pump should be in operation and should an inoperable pump remain, the requirements of 3.3.A.7.a or b must be met. Thus, the proposed change constitutes the addition of a limiting condition for operation (LCO) not presently included in the technical specifications and does not compromise existing specifications aimed at maintaining decay heat removal capability.

Section III - No Significant Hazards Evaluation

In accordance with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based upon the following information:

1. Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response:

The proposed change provides flexibility consistent with existing Technical Specifications and W STS, without compromising decay heat removal capability. Should the one operating pump become inoperable, a second pump is available for decay heat removal and Specification 3.3.A.7.a or b is applicable. Additionally, the one hour allowed for the no pump running condition is not of sufficient duration to allow significant localized boron dilution due to stratification. Combined with the requirement for no operations that could cause dilution, the probability of exceeding shutdown margin in any region of the

core is not significantly increased. The requirement to maintain core exit temperature 10°F below saturation provides sufficient margin to the onset of boiling, including time to restore cooling before boiling occurs in any part of the core. Thus, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response:

The proposed change does not compromise the decay heat removal redundancy criteria set forth by the Commission's June 11, 1980 letter. In addition, changes to setpoints or hardware are not involved, and the operation of RCS/RHR temperature and flow instrumentation are not affected. Hence, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

In accordance with Specification 3.3.A.7, two RHR pumps are required to be operable during the cold shutdown condition above 140°F . Should the one operating pump become inoperable, a second pump is available for decay heat removal and Specification 3.3.A.7.a or b is applicable. Thus, the proposed change does not adversely affect existing specifications. In addition, the proposed change does not affect the operation of RCS/RHR surveillance instrumentation. Moreover, as discussed in response to question 1, the proposed change does not involve a significant increase in the probability of exceeding the shutdown margin in any region of the core. Since decay heat removal capability, system flow and temperature indication, and shutdown margin are not adversely affected, the proposed change does not involve a reduction in a margin of safety.

The Authority considers that the proposed change can be classified as not likely to involve significant hazards considerations since the proposed change constitutes the

addition of a limiting condition for operation (LCO) not presently included, ensures consistency with existing technical specifications and W STS, and does not compromise decay heat removal capability.

Section IV - Impact of Change

This change will not adversely impact the following:

1. ALARA Program
2. Security and Fire Protection Programs
3. Emergency Plan
4. FSAR or SER Conclusions
5. Overall Plant Operations and the Environment

Section V - Conclusion

The incorporation of this change: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the bases for any Technical Specification; d) does not constitute an unreviewed safety question; and e) involves no significant hazards considerations as defined in 10 CFR 50.92.

Section VI - References

1. IP3 FSAR
2. IP3 SER
3. Letter from NRC (S.A. Varga) to NYPA (C.A. McNeill, Jr.) dated April 8, 1985, transmitting Amendment No. 53 to Facility Operating License DPR-64.
4. Letter from NYPA (C.A. McNeill, Jr.) to NRC (S.A. Varga) dated December 3, 1984 (IPN-84-59), entitled "Additional Information Regarding Redundant Decay Heat Removal Capability and Associated Proposed Changes to the Technical Specifications."
5. Letter from NRC (S.A. Varga) to NYPA (J.P. Bayne) dated October 15, 1984, entitled "Redundant Decay Heat Removal Capability Technical Specifications."
6. Letter from NYPA (J.P. Bayne) to NRC (S.A. Varga) dated July 6, 1983 (IPN-83-65), entitled "Proposed Changes to the Technical Specifications Regarding Decay Heat Removal Capability."

7. Letter from NRC (D.G. Eisenhut) to all Operating PWR's dated June 11, 1980 Regarding Redundant Decay Heat Removal Capability.
8. W STS, NUREG-0452