ATTACHMENT I TO IPN-99-040

PROPOSED TECHNICAL SPECIFICATION CHANGES ASSOCIATED WITH DNB LIMITS

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

3.1 Reactor Coolant System (RCS)

H. RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

Specification

1. During the POWER OPERATION CONDITION, RCS DNB parameters for pressurizer pressure and RCS average temperature shall be within the limits specified below:

   a. Pressurizer pressure ≥ 2205 psig;

   b. Maximum indicated T_{avg} ≤ 571.5°F; and

2. At the POWER OPERATION CONDITION with four reactor coolant pumps running, the RCS DNB parameter for RCS total flow rate shall be within the following limit:

   RCS total flow rate ≥ 375,600 gpm.

3. The pressurizer pressure limit of Specification 3.1.H.1 does not apply during:

   a. THERMAL POWER ramp > 5% RTP per minute; or

   b. THERMAL POWER step > 10% RTP.

4. If pressurizer pressure, RCS average temperature, or RCS total flow rate are not in accordance with Specifications 3.1.H.1, 3.1.H.2, or 3.1.H.3, then, immediately verify that the safety limits of Specification 2.1 have not been exceeded and, within 2 hours, restore the RCS DNB parameter(s) to within limits.

5. If pressurizer pressure and/or RCS average temperature are not restored to within limits within 2 hours, be in the HOT SHUTDOWN CONDITION within 6 hours.

6. If RCS total flow rate is not restored to within the limits of Specification 3.1.H.2 within 2 hours, bring THERMAL POWER to ≤ 10% RTP within 6 hours and ensure operation is in accordance with Specification 3.1.A.1.e.

Surveillance Requirements

Reference Technical Specification Table 4.1-1, Items 4, 5, and 7, and Section 4.3.B.

Bases

Background

These Bases address requirements for maintaining RCS pressure, temperature, and flow rate within limits assumed in the safety analyses. The safety analyses (Ref. 1) of normal operating conditions and anticipated operational occurrences assume initial conditions within the normal steady state envelope. The limits placed on RCS

ATTACHMENT II TO IPN-99-040

SAFETY EVALUATION OF PROPOSED TECHNICAL SPECIFICATION CHANGES ASSOCIATED WITH DNB LIMITS

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

SAFETY EVALUATION RELATED TO
PROPOSED TECHNICAL SPECIFICATION CHANGES ASSOCIATED WITH
DNB LIMITS

Section I - Description of Changes

This application for amendment seeks to revise Appendix A (Section 3.1) of the Indian Point 3 Technical Specifications (TS). This TS change will remove the footnote restriction found on page 3.1-36 which states that the departure from nucleate boiling (DNB) analysis contains adequate margin for Cycle 10, but needs to be reviewed/approved prior to Cycle 11.

Section II - Evaluation of Changes

TS Amendment 175 (Reference 1) granted approval of the use of Vantage+ (V+) fuel at Indian Point 3 (IP3). During the approval process for this amendment, the NRC, Westinghouse, and the Authority met on June 5, 1997 to discuss the applicability of the WRB-1 correlation to the 15 x 15 V+ fuel proposed for use at IP3. WRB-1 is a critical heat flux (CHF) correlation which predicts the CHF in rod bundles based on subchannel local fluid conditions. At this meeting the NRC expressed concern regarding the use of the WRB-1 correlation to predict the DNB performance for the 15 x 15 V+ fuel type, as confirmatory fuel tests had not been performed on this fuel type. However, the NRC stated that the use of the WRB-1 correlation with a 95/95 correlation DNB ratio (DNBR) limit of 1.17 for the 15x15 V+ fuel during Cycle 10 was acceptable because of the large DNBR margin available. As a result of this meeting, the Authority submitted a supplement to the V+ TS change (Reference 2) which added the following footnote to TS page 3.1-36.

> "Current DNB analysis contains adequate margin for Cycle 10. Prior to achieving criticality in Cycle 11, the DNB analysis must be reviewed and approved by NRC staff."

The NRC approved the upgrade to V+ fuel in Amendment 175. The SER states, in part,

> "No testing was conducted to verify that the scaling technique applied to the 15x15 standard fuel; however, cycle 10 analyses [have] shown that there is substantial departure from nucleate boiling ratio (DNBR) margin. Consequently, until such time as fuel tests are conducted on the 15x15 VANTAGE+ (w/ IFMs) to [validate] the scaling technique and the applicability of the WRB-1 correlation, [use of the WRB-1 correlation with this fuel design] is acceptable for the upcoming cycle 10 only. Also, the DNB analyses must be submitted to the staff for review and approval prior to cycle 11."

The Authority interpreted this SER statement to mean that V+ fuel was only approved for use at IP3 during cycle 10. Approval beyond cycle 10 was contingent upon one of the following.

1. NRC approval of the IP3 DNB analyses for cycle 11 to ensure that sufficient DNBR margin exists.

OR

2. Fuel tests, conducted by Westinghouse on the 15x15 V+ fuel design, which validate the applicability of the WRB-1 correlation to this fuel type.

The second option was completed when Westinghouse conducted confirmatory DNB testing on the 15x15 fuel design (with Intermediate Flow Mixers) in December 1998 / January 1999. The results of this testing demonstrated that the use of the WRB-1 correlation with the 15x15 V+ fuel is conservative and confirmed its applicability for this fuel type. Therefore, this amendment application requests removal of the footnote on page 3.1-36 of the IP3 TS. Removal of this footnote allows continued use of the WRB-1 correlation to predict DNB performance of V+ fuel for IP3 Cycle 11 and beyond, and eliminates the need for NYPA to submit to the NRC the IP3 specific DNB margin analysis for future cycles.

The fuel tests results were discussed during a March 17, 1999 meeting between the NRC, Westinghouse, and the Authority. Westinghouse documented this meeting in a letter to the NRC dated March 29, 1999 (Reference 3). During this meeting, the NRC acknowledged that these test results validate the use of the WRB-1 correlation for V+ fuel.

Section III - No Significant Hazards Evaluation

Consistent with the criteria of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based on the following information:

(1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously analyzed?

Response:

The proposed change does not involve a significant increase in the probability or consequences of an accident previously analyzed. The removal of the footnote on TS page 3.1-36 is an administrative change in that it does not affect the DNB limits of the current TS. The footnote was added to the TS as part of Amendment 175, which permitted the use of V+ fuel at IP3. The footnote required the Authority to demonstrate that sufficient DNB margin existed for Cycle 11, prior to achieving criticality for that cycle. The NRC requested this DNB limitation because the applicability of the WRB-1 correlation to predict DNB performance for the V+ fuel had not been adequately proven by fuel tests. Westinghouse has completed fuel tests which verify that the use of the WRB-1 correlation with the 15x15 V+ fuel is conservative. Therefore, this DNB limitation is no longer applicable and the footnote can be removed.

(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 create the possibility of a new or different kind of accident, as the removal of the footnote on TS page 3.1-36 does not affect the current TS DNB limits, plant equipment, or the way the plant is operated. This footnote was inserted into the TS as part of Amendment 175, which permitted the use of 15 x 15 V+ fuel at IP3. Westinghouse had used scaling techniques to demonstrate that the WRB-1 correlation correctly predicted the critical heat flux performance of the 15 x 15 V+ fuel. Since no fuel tests had been performed on this fuel design, the NRC was concerned that the use of this correlation may be unconservative. Therefore, approval to use the V+ fuel at IP3 was granted based upon the DNB margin available during Cycle 10. This limitation was contained in the footnote on TS page 3.1-36. Westinghouse has recently completed fuel tests on 15 x 15 V+ fuel which verify that the use of the WRB-1 correlation is conservative. Therefore, the use of V+ fuel at IP3 is no longer dependent on the amount of DNB margin available and the footnote can be removed.

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

Response:

The proposed deletion of the footnote on TS page 3.1-36 does not involve a significant reduction in a margin of safety. The footnote was introduced as part of Amendment 175, which permitted the use of V+ fuel at IP3. The footnote required the Authority to demonstrate that sufficient DNB margin existed for Cycle 11, prior to achieving criticality for that cycle. The NRC requested this DNB limitation because the applicability of the WRB-1 correlation to predict DNB performance for the V+ fuel had not been adequately proven by fuel tests. Westinghouse has completed fuel tests which verify that the use of the WRB-1 correlation with the 15x15 V+ fuel is conservative. Therefore, this DNB limitation is no longer applicable and the footnote can be removed. The removal of the footnote is an administrative change as deleting it does not alter the current DNB margin or future DNB margins.

Section IV – Impact of Changes

These changes will not adversely affect the following:

ALARA Program
Security and Fire Protection Programs
Emergency Plan
FSAR or SER Conclusions
Overall Plant Operations and the Environment

Section V – Conclusions

The incorporation of these changes: 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; and d) involves no significant hazards considerations as defined in 10 CFR 50.92.

Section VI – References

1. NRC letter (Amendment 175), G. Wunder to J. Knubel, "Issuance of Amendment for Indian Point Nuclear Generating Unit No. 3 (TAC No. M97482)" dated July 15, 1997.

2. NYPA letter to NRC (IPN-97-075), "Supplement to Proposed Technical Specification Changes Associated with the Upgrade to VANTAGE+ Fuel," dated June 16, 1997.

3. Westinghouse letter to NRC (NSD-NRC-99-5828), "Notification of FCEP Application for DNB Testing for Revalidation of WRB-1 Applicability to the 15x15 VANTAGE+ Fuel Design, (Proprietary)," dated March 29, 1999.

ATTACHMENT III TO IPN-99-040

MARK-UP OF TECHNICAL SPECIFICATION PAGES ASSOCIATED WITH DNB LIMITS

(For Information Only)

NOTE 1: Deletions are shown in ~~strikeout~~, and additions are shown in **bold**.

NOTE 2: Previous amendment revision bars are not shown.

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