



Ernest J. Kapopoulos, Jr.
H. B. Robinson Steam Electric Plant Unit 2
Site Vice President

Duke Energy
3581 West Entrance Road
Hartsville, SC 29550
O: 843 951 1701
F: 843 951 1319
Ernie.Kapopoulos@duke-energy.com

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10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261 / RENEWED LICENSE NO. DPR-23

**SUBJECT: Correction to Non-Conservative Technical Specifications Figure 3.4.3-2,
Pressure/Temperature Limit Cooldown Curves**

REFERENCE:

1. NRC letter, *H. B. Robinson Steam Electric Plant, Unit No. 2 - Issuance of Amendment to Revise Reactor Coolant System Pressure and Temperature Limits Applicable for 50 Effective Full Power Years (CAC No. MF7048)*, dated November 22, 2016 (ADAMS Accession No. ML16285A404)

Ladies and Gentlemen:

In accordance with the provisions of 10 CFR 50.90, Duke Energy Progress, LLC, referred to henceforth as "Duke Energy," is submitting a License Amendment Request (LAR) for the Renewed Facility Operating License (FOL) for the H. B. Robinson Steam Electric Plant (RNP), Unit No. 2, related to Technical Specification (TS) 3.4.3, "RCS Pressure and Temperature (P/T) Limits." Specifically, a portion of TS Figure 3.4.3-2 (P/T limit cooldown curves) is being corrected because it does not reflect the data approved in Amendment No. 248 (Reference 1).

This LAR is required to correct a non-conservative TS. Current plant operations are administratively controlled consistent with Nuclear Regulatory Commission (NRC) Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety." In accordance with the guidance in AL 98-10, this LAR is required to resolve non-conservative TS and is not a voluntary request from a licensee to change its licensing basis. Therefore, this request is not subject to 'forward fit' considerations as described in the letter from S. Burns (NRC) to E. Ginsberg (NEI), dated July 14, 2010 (ADAMS Accession Number ML101960180).

Enclosure 1 provides an evaluation of the proposed change. Attachments 1 and 2 provide the marked-up and retyped (clean) TS pages, respectively. The proposed changes have been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c), and it has been determined that the proposed changes involve no significant hazards consideration. The bases for these determinations are included in Enclosure 1.

Duke Energy requests approval of the proposed license amendments within one year of completion of the NRC's acceptance review. Once approved, the amendments shall be implemented within 120 days.

This submittal contains no new regulatory commitments. In accordance with 10 CFR 50.91, Duke Energy is notifying the state of South Carolina of this license amendment request by transmitting a copy of this letter to the designated state officials. Should you have any questions concerning this letter, or require additional information, please contact Lee Grzeck, Manager (Acting) – Nuclear Fleet Licensing, at 980-373-1530.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 9, 2021.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Kapopoulos, Jr.', with a stylized, cursive script.

Ernest J. Kapopoulos, Jr.
Site Vice President

Enclosure:

1. Evaluation of the Proposed Change

Attachments:

1. Marked-Up Technical Specifications Pages
2. Retyped Technical Specifications Pages

cc: (all with Enclosures/Attachments unless otherwise noted)

L. Dudes, Regional Administrator USNRC Region II
M. Fannon, NRC Senior Resident Inspector
T. Hood, NRR Project Manager

L. Garner, Manager, Radioactive and Infectious Waste Management Section (SC)
A. Nair, Director, Nuclear Response (SC)
A. Wilson, Attorney General (SC)

Enclosure 1

EVALUATION OF THE PROPOSED CHANGE

- 1.0 SUMMARY DESCRIPTION
- 2.0 DETAILED DESCRIPTION
 - 2.1 System Design and Operation
 - 2.2 Current Technical Specifications Requirements
 - 2.3 Reason for the Proposed Change
 - 2.4 Description of the Proposed Change
- 3.0 TECHNICAL EVALUATION
- 4.0 REGULATORY EVALUATION
 - 4.1 Applicable Regulatory Requirements/Criteria
 - 4.2 Precedent
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 - 4.4 Conclusions
- 5.0 ENVIRONMENTAL CONSIDERATION
- 6.0 REFERENCES

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend the Renewed Facility Operating License (FOL) for the H. B. Robinson Steam Electric Plant (RNP), Unit No. 2, related to Technical Specification (TS) 3.4.3, "RCS Pressure and Temperature (P/T) Limits." Specifically, a portion of TS Figure 3.4.3-2 (P/T limit cooldown curves) is being corrected because it does not reflect the data approved in Amendment No. 248 (Reference 1).

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

All components of the RNP Reactor Coolant System (RCS) are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients and reactor trips. RNP is required to limit the pressure and temperature changes during RCS heatup and cooldown within the design assumptions and the stress limits for cyclic operation.

RNP TS Limiting Condition for Operation (LCO) 3.4.3 establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary (RCPB). The RNP TSs contain P/T limit curves for heatup, cooldown, inservice leak and hydrostatic (ISLH) testing and data for the maximum rate of change of reactor coolant temperature. Each P/T limit curve defines an acceptable region for normal operation. These curves provide an operational limit during heatup or cooldown maneuvering, when pressure and temperature indications are monitored and compared to the applicable curve to determine that operation is within the allowable region.

The RNP Updated Final Safety Analysis Report (UFSAR) Section 5.3.2 provides additional details regarding the methodology used to develop the P/T limit curves.

2.2 Current Technical Specifications Requirements

RNP LCO 3.4.3 requires that RCS pressure, RCS temperature and RCS heatup and cooldown rates be maintained within the limits specified in Figures 3.4.3-1 (P/T limit heatup curves) and 3.4.3-2 (P/T limit cooldown curves) at all times. The two elements of LCO 3.4.3 are:

- The limit curves for heatup, cooldown and ISLH testing; and
- Limits on the rate of change of temperature.

2.3 Reason for the Proposed Change

It has been identified that a portion of TS Figure 3.4.3-2 (P/T limit cooldown curves) does not reflect the P/T limit data approved in Amendment No. 248 (Reference 1) and is non-conservative. This license amendment corrects the figure to match the approved data. It is noted that data from historical plant cooldowns has been reviewed since implementation of the incorrect P/T limit curves and it was found that the approved P/T limits were not violated.

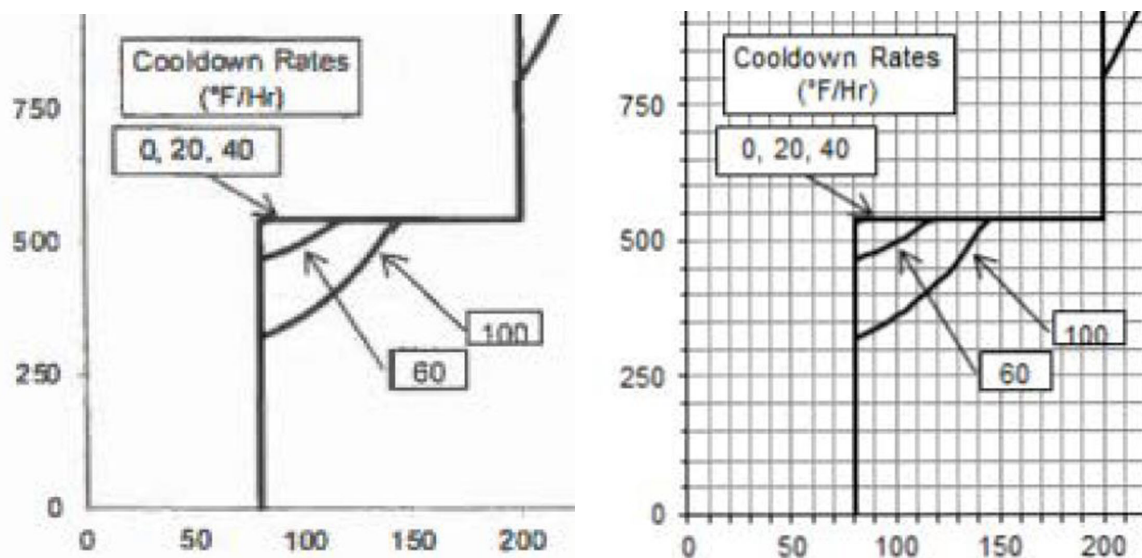
2.4 Description of the Proposed Change

A portion of TS Figure 3.4.3-2 (P/T limit cooldown curves) is being corrected because it does not reflect the P/T limit data approved in Amendment No. 248 (Reference 1). Specifically, the portion of Figure 3.4.3-2 being corrected is the 60°F/hr and 100°F/hr curves at temperatures below 150°F.

The technical basis for the Reference 1 amendment is WCAP-15827, "H. B. Robinson Unit 2 Heatup and Cooldown Limit Curves for Normal Operation," which was included as Attachment 4 in the Reference 2 amendment request. Table 28 of WCAP-15827 provides the appropriate cooldown curve data.

The following example illustrates the correction needed to Figure 3.4.3-2 (note that the stated values include the +20°F and -80 PSIG adjustment for instrumentation error on top of the WCAP-15827 Table 28 data). It can be seen from Table 28 of WCAP-15827 that the 100°F/hr curve should start its downward trajectory from 541 PSIG at 150°F, but Figure 3.4.3-2 shows it starting at approximately 145°F. Similarly, the 60°F/hr curve should start its downward trajectory from 541 PSIG at 125°F, but Figure 3.4.3-2 shows it starting at approximately 115°F.

Below is a closeup of Figure 3.4.3-2 for convenience (horizontal axis is temperature; vertical axis is pressure). The left-hand closeup is from the current RNP TS; the right-hand closeup is from the Reference 2 amendment request, included as a visual aid due to the inclusion of gridlines.



The proposed change revises the 60°F/hr and 100°F/hr curves to reflect the WCAP-15827 Table 28 data.

3.0 TECHNICAL EVALUATION

The technical justification and NRC approval of the WCAP-15827 Table 28 data (adjusted for instrumentation error) is provided in Reference 2 and Reference 1, respectively. The Reference 1 NRC safety evaluation utilized the WCAP-15827 Table 28 data as basis for approval, as indicated below:

The NRC staff's calculations included verifying that (1) the requirements in Table 1 "Pressure and Temperature Requirements for the Reactor Pressure Vessel" of Section IV.A of Appendix G to 10 CFR Part 50 and (2) the instrumentation errors specified in the licensee's submittal were correctly applied. The NRC staff also verified that for the lower temperature range of the cooldown P-T limit curve, the limiting material is the Upper Shell Plate W10201-1 and for the higher temperature range, the limiting material is the Circumferential Weld Seam 10-273 as reflected in Table 28 "50 EFPY Cooldown Curve Data Points Using 1996 App. G" of WCAP-15827. Based on these confirmatory calculations, the NRC staff finds the licensee's proposed 50 EFPY heatup and cooldown curves (including the leak test and criticality limits) reflected in the revised Figure 3.4.3-1, "Reactor Coolant System Heatup Limits Applicable Up to 50 EFPY," and revised Figure 3.4.3-2, "Reactor Coolant System Cooldown Limitations Applicable Up to 50 EFPY," respectively, of the HBRSEP2 TSs included in Attachments 2 and 3 of the LAR (Reference 1), acceptable.

Reference 1 (Amendment 248) approved P/T limit curves applicable up to 50 effective full power years (EFPY) on November 22, 2016. Subsequently on August 16, 2018, the Reference 3 safety evaluation (Amendment 260) approved reducing the P/T limit curves applicability term from 50 EFPY to 46.3 EFPY and confirmed that the existing P/T limits remain valid. Therefore, the WCAP-15827 Table 28 data remains applicable to the current (Amendment 260) RNP P/T limit curves.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Title 10 of the Code of Federal Regulations (10 CFR) Section 50.36, "Technical specifications," establishes the requirements related to the content of the TSs. Pursuant to 10 CFR 50.36(c) TSs will include items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings, (2) LCOs, (3) surveillance requirements, (4) design features; and (5) administrative controls.

Section 50.60 of 10 CFR, "Acceptance criteria for fracture prevention measures for lightwater nuclear power reactors for normal operation," imposes fracture toughness and material surveillance program requirements, which are set forth in 10 CFR 50, Appendices G, "Fracture Toughness Requirements," and H, "Reactor Vessel Material Surveillance Program Requirements." Appendix G to 10 CFR 50 requires that the P/T limits for the facility's reactor pressure vessel (RPV) be at least as conservative as those obtained by following the linear elastic fracture mechanics methodology of Appendix G to Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). Appendix H to 10 CFR 50 establishes requirements for each facility related to its RPV material surveillance.

The proposed change updates TS Figure 3.4.3-2 (P/T limit cooldown curves) to reflect NRC approved data. The aforementioned requirements will continue to be met.

4.2 Precedent

Recent examples of non-conservative TS corrections include Hatch Nuclear Plant safety evaluation dated July 8, 2019 (Reference 4) and Shearon Harris Nuclear Power Plant safety evaluation dated March 22, 2021 (Reference 5). One notable difference is that the listed precedents identify technical reasons that previously approved TS values need to be changed, whereas this proposed RNP LAR administratively corrects the P/T figure to accurately reflect values that were used as the basis for previous NRC approval.

4.3 No Significant Hazards Consideration Determination

Duke Energy Progress, LLC, referred to henceforth as "Duke Energy," is submitting a License Amendment Request (LAR) for the Renewed Facility Operating License (FOL) for the H. B. Robinson Steam Electric Plant (RNP) related to Technical Specification (TS) 3.4.3, "RCS Pressure and Temperature (P/T) Limits." Specifically, a portion of TS Figure 3.4.3-2 (P/T limit cooldown curves) is being corrected because it does not reflect the data approved in Amendment No. 248 (Reference 1).

Duke Energy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change updates TS Figure 3.4.3-2 (P/T limit cooldown curves) to reflect NRC approved data. The proposed change does not alter the design, configuration, operation, or function of any plant structure, system, or component. In addition, there is no change to any equipment response or accident mitigation scenario, and consequently no additional challenges to fission product barrier integrity. There is no impact on the source term or pathways assumed in accidents previously assumed. No analysis assumptions are violated and there are no adverse effects on the factors that contribute to offsite or onsite dose as the result of an accident. Compliance with the proposed P/T curves will prohibit operation in regions where it is possible for brittle fracture of reactor vessel materials to occur, thereby assuring that the integrity of the RCS pressure boundary is maintained.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed change updates TS Figure 3.4.3-2 (P/T limit cooldown curves) to reflect NRC approved data. No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed changes. The proposed changes do not challenge the performance or integrity of any safety related system. The proposed changes neither install nor remove any plant equipment, nor alters the design, physical configuration, or mode of operation of any plant structure, system, or component. No physical changes are being made to the plant, so no new accident causal mechanisms are being introduced. Compliance with the proposed P/T curves will provide sufficient protection against brittle fracture of reactor vessel materials to assure that the RCS pressure boundary performs as previously evaluated.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The proposed change updates TS Figure 3.4.3-2 (P/T limit cooldown curves) to reflect NRC approved data. The proposed changes will have no effect on the availability, operability, or performance of the safety related systems and components. The proposed changes do not alter the design, configuration, operation, or function of any plant structure, system, or component. The ability of any operable structure, system, or component to perform its designated safety function is unaffected by the proposed changes. Compliance with the proposed P/T curves provides an adequate margin of safety to the conditions at which brittle fracture of reactor vessel materials may occur, thereby assuring that the integrity of the RCS pressure boundary is maintained.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above, Duke Energy concludes that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed changes would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

6.0 REFERENCES

1. NRC letter, *H. B. Robinson Steam Electric Plant, Unit No. 2 - Issuance of Amendment to Revise Reactor Coolant System Pressure and Temperature Limits Applicable for 50 Effective Full Power Years (CAC No. MF7048)*, dated November 22, 2016 (ADAMS Accession No. ML16285A404)
2. Duke Energy letter, *Request for Technical Specification Change to Reactor Coolant System Pressure and Temperature Limits*, dated November 2, 2015 (ADAMS Accession No. ML15307A069)
3. NRC letter, *H. B. Robinson Steam Electric Plant, Unit No. 2 - Issuance of Amendment No. 260 Regarding Request to Revise Technical Specification Reactor Coolant System Pressure and Temperature Limits to Reflect 24-Month Fuel Cycles (EPID L-2017-LLA-0033)*, dated August 16, 2018 (ADAMS Accession No. ML18200A042)
4. NRC letter, *Edwin I. Hatch Nuclear Plant, Unit Nos. 1 and 2, Issuance of Amendments Regarding License Amendment Request to Correct Non-Conservative Technical Specification Allowable Values For The Condensate Storage Tank Low Level Transfer Function (EPID L-2018-LLA-0186)*, dated July 8, 2019 (ADAMS Accession No. ML19177A166)
5. NRC letter, *Shearon Harris Nuclear Power Plant, Unit 1 - Issuance of Amendment No. 183 to Correct Non-Conservative Technical Specification Related to Reactor Coolant System Pressure/Temperature Limits (EPID L-2020-LLA-0111)*, dated March 22, 2021 (ADAMS Accession No. ML21033B007)

Attachment 1 to Enclosure 1
RA-21-0254

Attachment 1

**Marked-Up Technical Specifications Pages
(2 pages follow)**

Replace with INSERT 1

RCS P/T Limits
3.4.3

MATERIALS PROPERTIES BASE

Controlling Material: Upper Shell Plate W10201-1 & Girth Weld 10-273

Limiting ART Values at 46.3 EFPY: 1/4T, 172°F & 263°F

3/4T, 153°F & 191°F

Curves applicable for cooldown rates up to 100° F/Hr for the service period up to 46.3 EFPY. Curves include +20°F and -80 PSIG Allowance for instrumentation error.

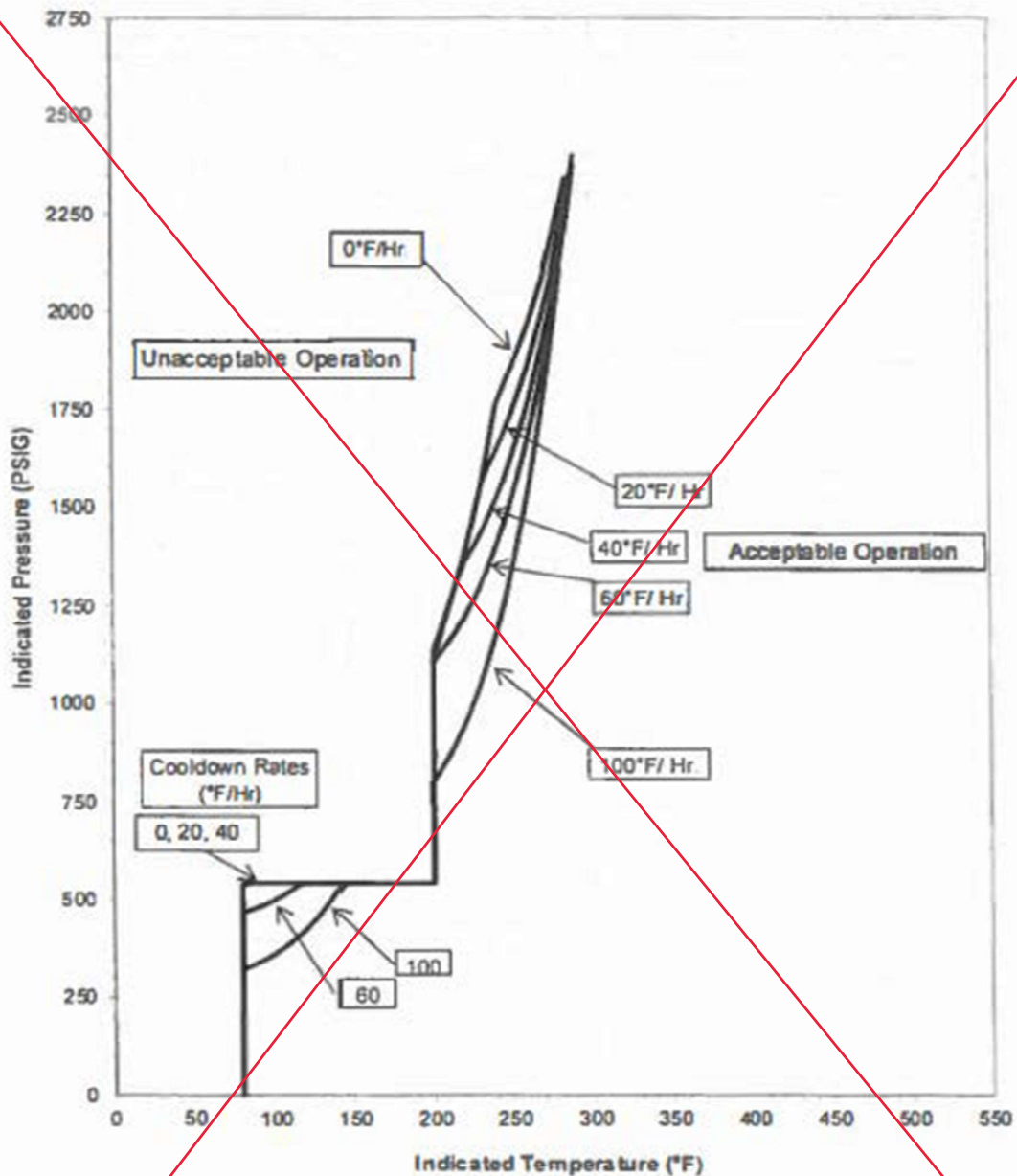


Figure 3.4.3-2
Reactor Coolant System Cooldown Limitations
Applicable Up to 46.3 EFPY

INSERT 1

MATERIALS PROPERTIES BASE

Controlling Material: Upper Shell Plate W10201-1 & Girth Weld 10-273

Limiting ART Values at 50 EFPY: 1/4T, 172°F & 263°F
3/4T, 153°F & 191°F

Curves applicable for cooldown rates up to 100° F/Hr for the service period up to 46.3 EFPY.

Curves include +20°F and -80 PSIG Allowance for Instrumentation error.

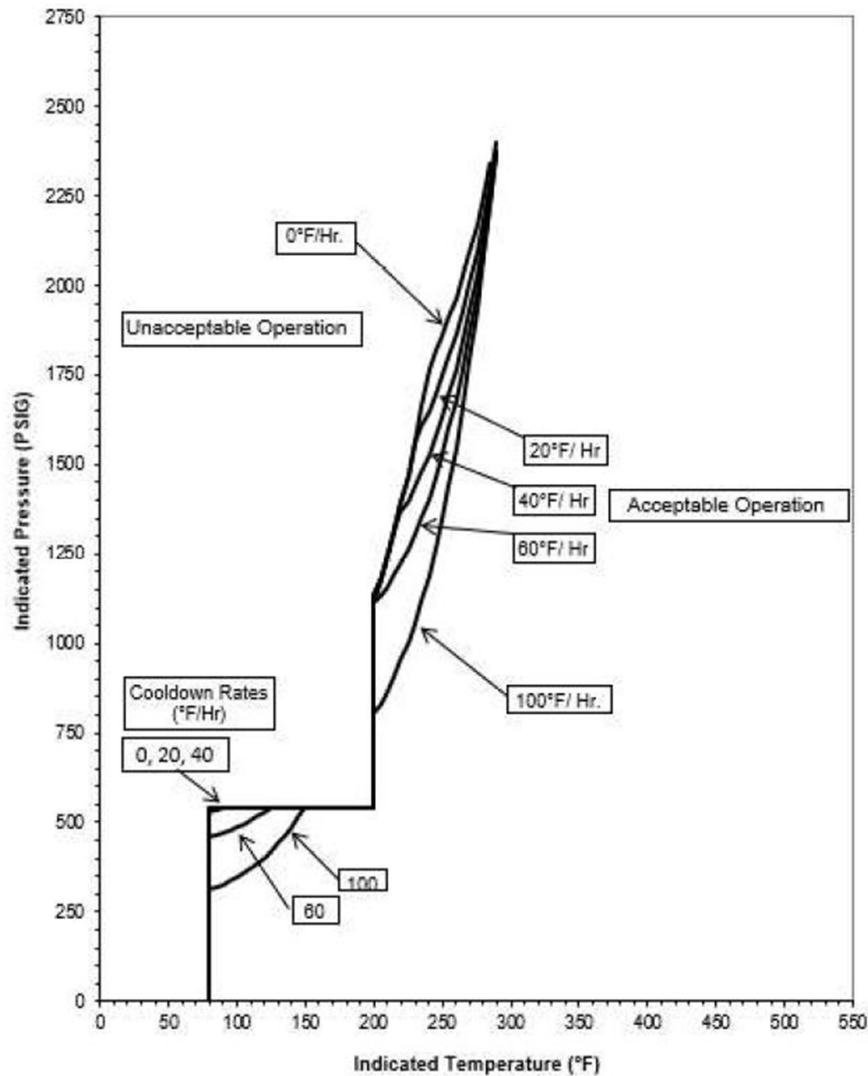


Figure 3.4.3-2
Reactor Coolant System Cooldown Limitations
Applicable Up to 46.3 EFPY

Attachment 2 to Enclosure 1
RA-21-02054

Attachment 2

**Retyped Technical Specifications Pages
(1 page follows)**

MATERIALS PROPERTIES BASE
Controlling Material: Upper Shell Plate W10201-1 & Girth Weld 10-273
Limiting ART Values at 50 EFPY: 1/4T, 172°F & 283°F
3/4T, 153°F & 191°F

Curves applicable for cooldown rates up to 100° F/Hr for the service period up to 46.3 EFPY.
Curves include +20°F and -80 PSIG Allowance for Instrumentation error.

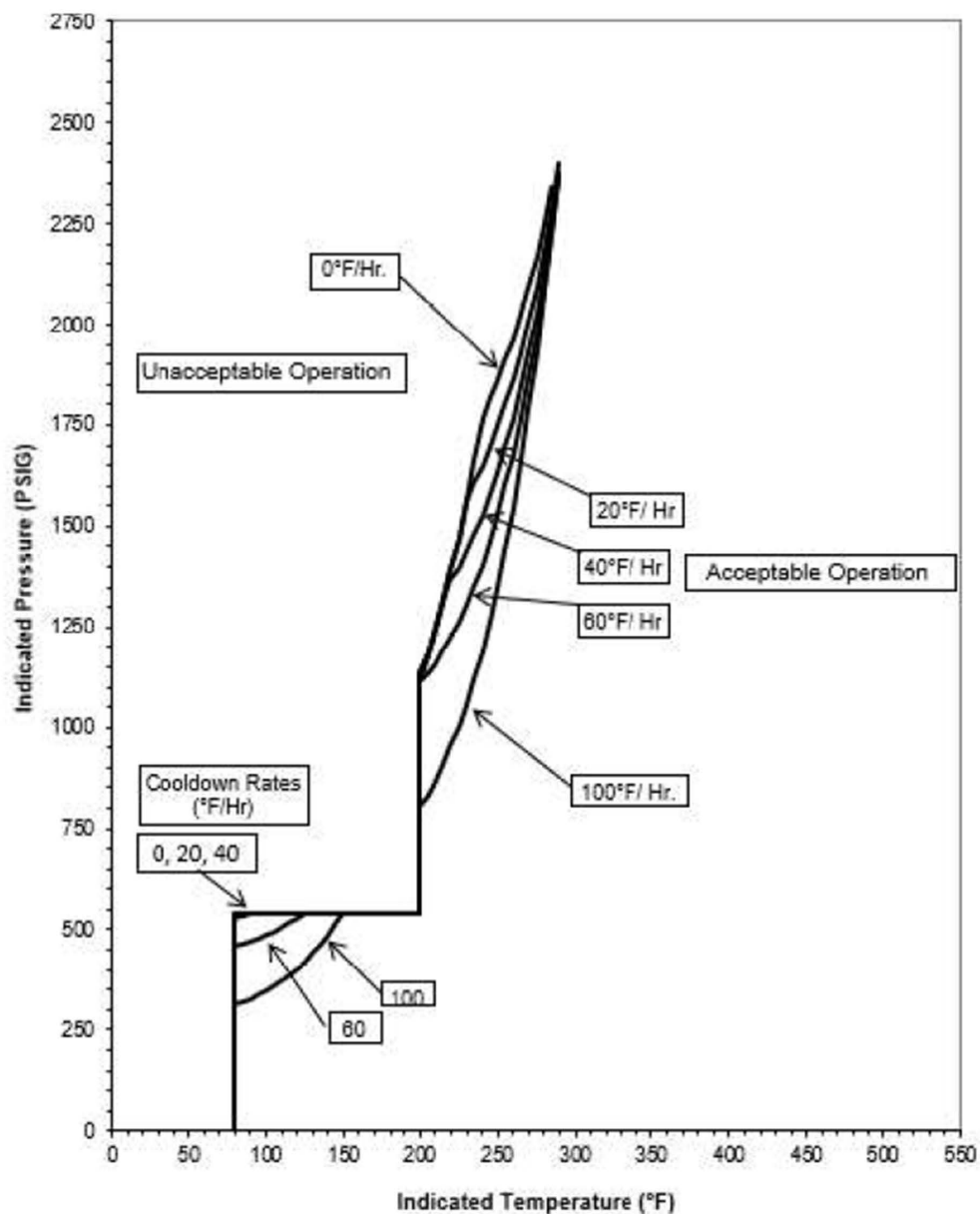


Figure 3.4.3-2
Reactor Coolant System Cooldown Limitations
Applicable Up to 46.3 EFPY