UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 29, 2022

Mr. Edward Pigott
Site Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2, ISSUANCE OF AMENDMENT NOS. 326 AND 305, REGARDING CHANGES TO TECHNICAL SPECIFICATION 3.4.3, REACTOR COOLANT SYSTEM PRESSURE AND TEMPERATURE LIMITS (EPID L-2021-LLA-0232)

Dear Mr. Pigott:

The Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 326 to Renewed Facility Operating License NPF-9 and Amendment No. 305 to Renewed Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The amendments consist of changes to the technical specifications (TS) in response to your application dated December 20, 2021.

The amendments revise TS 3.4.3, “RCS [Reactor Coolant System] Pressure and Temperature (P/T) Limits,” to reflect that the associated figures for Unit 1’s effective full power years (EFPY) are applicable up to 54 EFPY, and up to 38.6 EFPY for Unit 2’s figures.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission’s monthly *Federal Register* notice.

If you have any questions, please contact me at 301-415-5136 or by email at John.Klos@nrc.gov.

Sincerely,

/RA/

L John Klos, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosures:
1. Amendment No. 326 to NPF-9
2. Amendment No. 305 to NPF-17
3. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-369

MCGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 326
Renewed License No. NPF-9

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. NPF-9, filed by the Duke Energy Carolinas, LLC (licensee), dated December 20, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 326, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

Digitally signed by Michael T. Markley
Date: 2022.11.29 17:20:38 -05'00'

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. NPF-9
and the Technical Specifications

Date of Issuance: November 29, 2022

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-370

MCGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 305
Renewed License No. NPF-17

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. NPF-17, filed by the Duke Energy Carolinas, LLC (the licensee), dated December 20, 2021, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 305, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

Digitally signed by Michael T. Markley
Date: 2022.11.29 17:21:22 -05'00'

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. NPF-17
and the Technical Specifications

Date of Issuance: November 29, 2022

ATTACHMENT TO LICENSE AMENDMENT NO. 326 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-9

AND LICENSE AMENDMENT NO. 305

RENEWED FACILITY OPERATING LICENSE NO. NPF-17

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

Replace the following pages of Renewed Facility Operating License Nos. NPF-9 and NPF-17, and the Appendix A, Technical Specifications (TSs), with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
Licenses	Licenses
NPF-9, page 3	NPF-9, page 3
NPF-17, page 3	NPF-17, page 3
TS Pages	TS Pages
3.4.3-3	3.4.3-3
3.4.3-4	3.4.3-4
3.4.3-5	3.4.3-5
3.4.3-6	3.4.3-6
3.4.3-7	3.4.3-7
3.4.3-8	3.4.3-8

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as may be produced by the operation of McGuire Nuclear Station, Units 1 and 2, and;

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such byproduct material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 326, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than June 12, 2021, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as may be produced by the operation of McGuire Nuclear Station, Units 1 and 2, and;

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such byproduct material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 305, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than March 3, 2023, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL LONGITUDINAL WELD
LIMITING ART VALUES AT 54 EFPY: 1/4T, 202°F
3/4T, 146°F

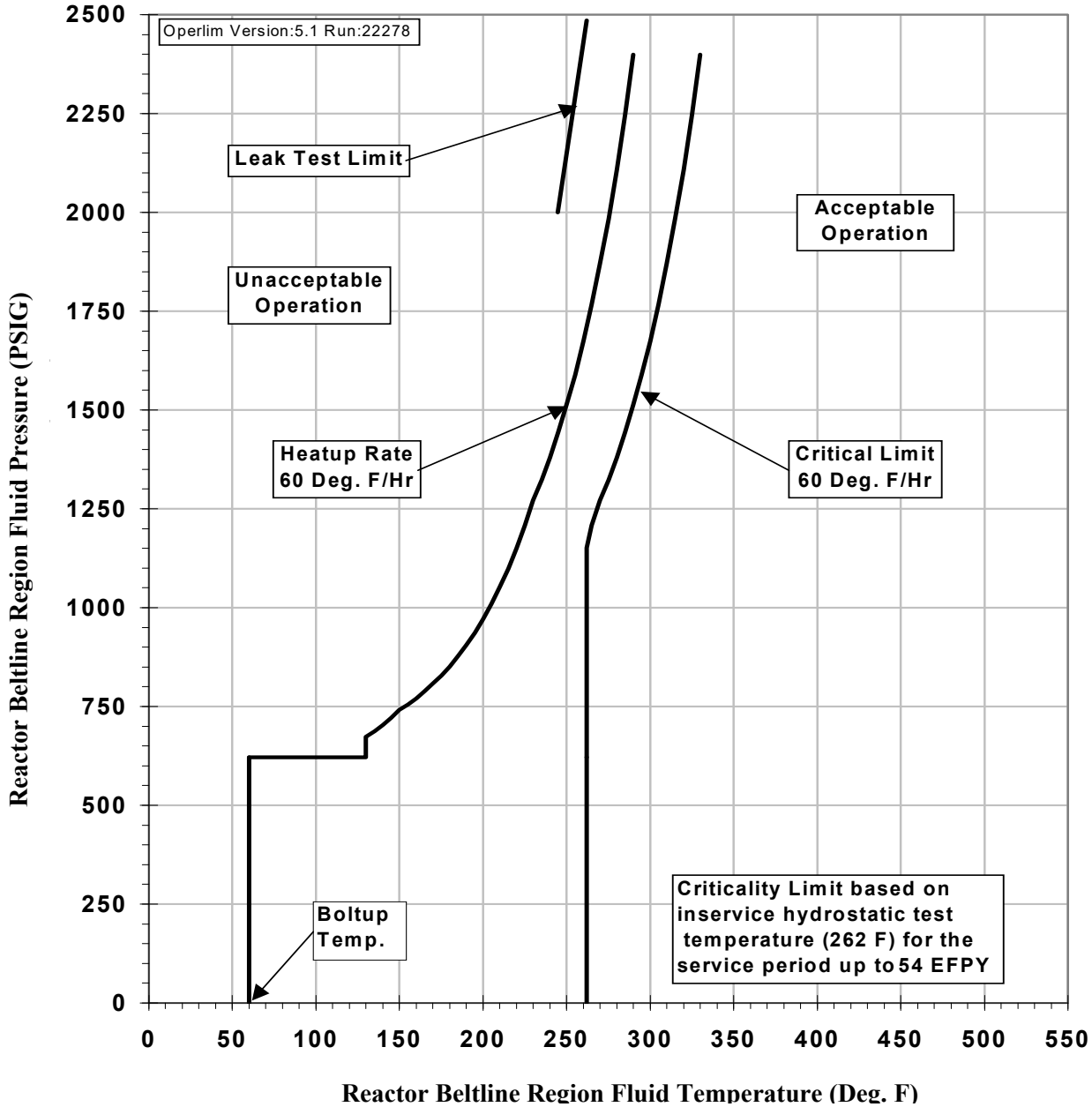

Figure 3.4.3-1 McGuire Unit 1 Reactor Coolant System Heatup Limitations (Heatup Rate of 60°F/hr) Applicable for the First 54 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL LONGITUDINAL WELD
LIMITING ART VALUES AT 54 EFPY: 1/4T, 202°F
3/4T, 146°F

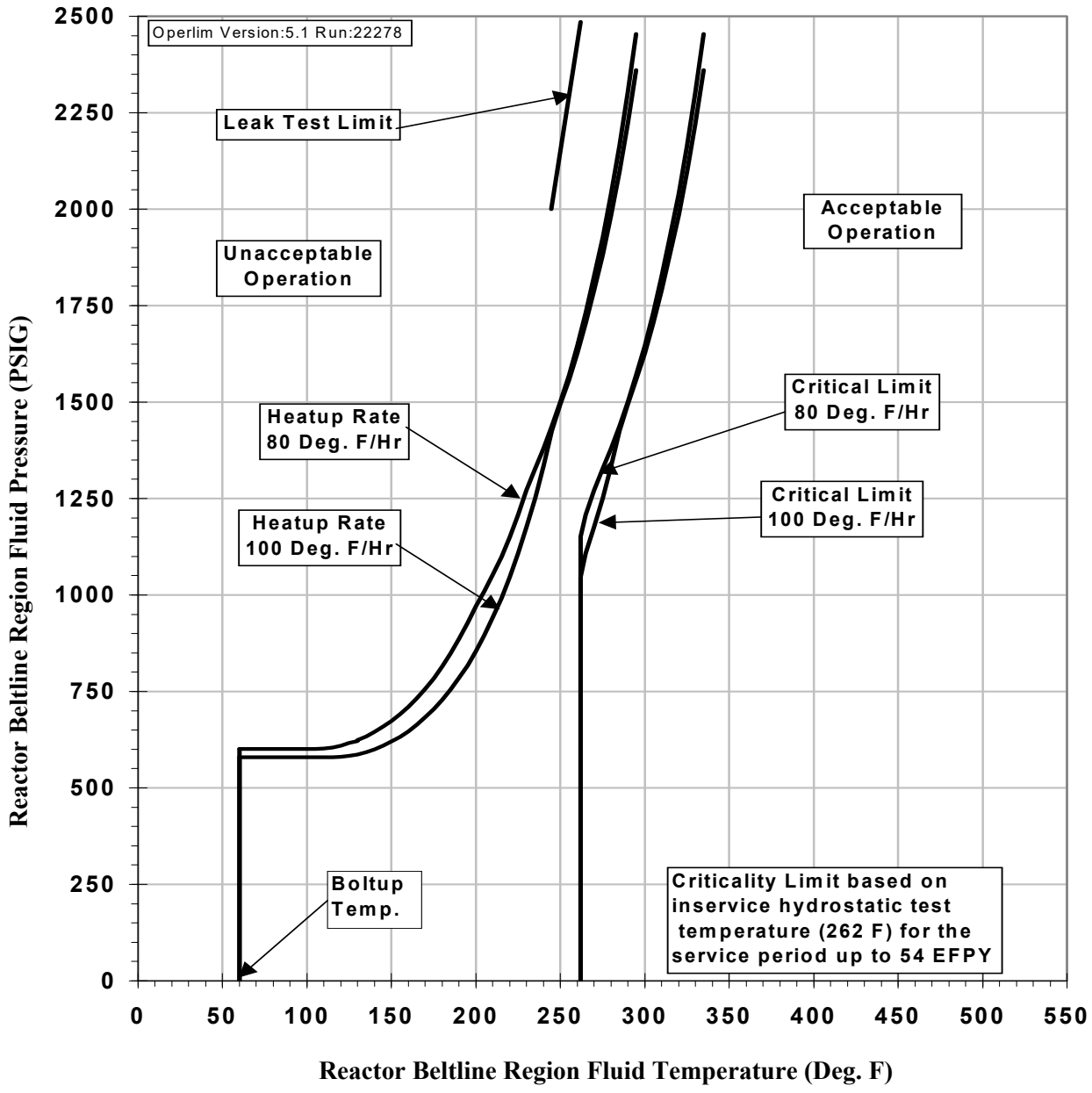

Figure 3.4.3-2 McGuire Unit 1 Reactor Coolant System Heatup Limitations (Heatup Rates of 80 & 100°F/hr) Applicable for the First 54 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL FORGING 04
LIMITING ART VALUES AT 38.6 EFPY: 1/4T, 123°F
3/4T, 91°F

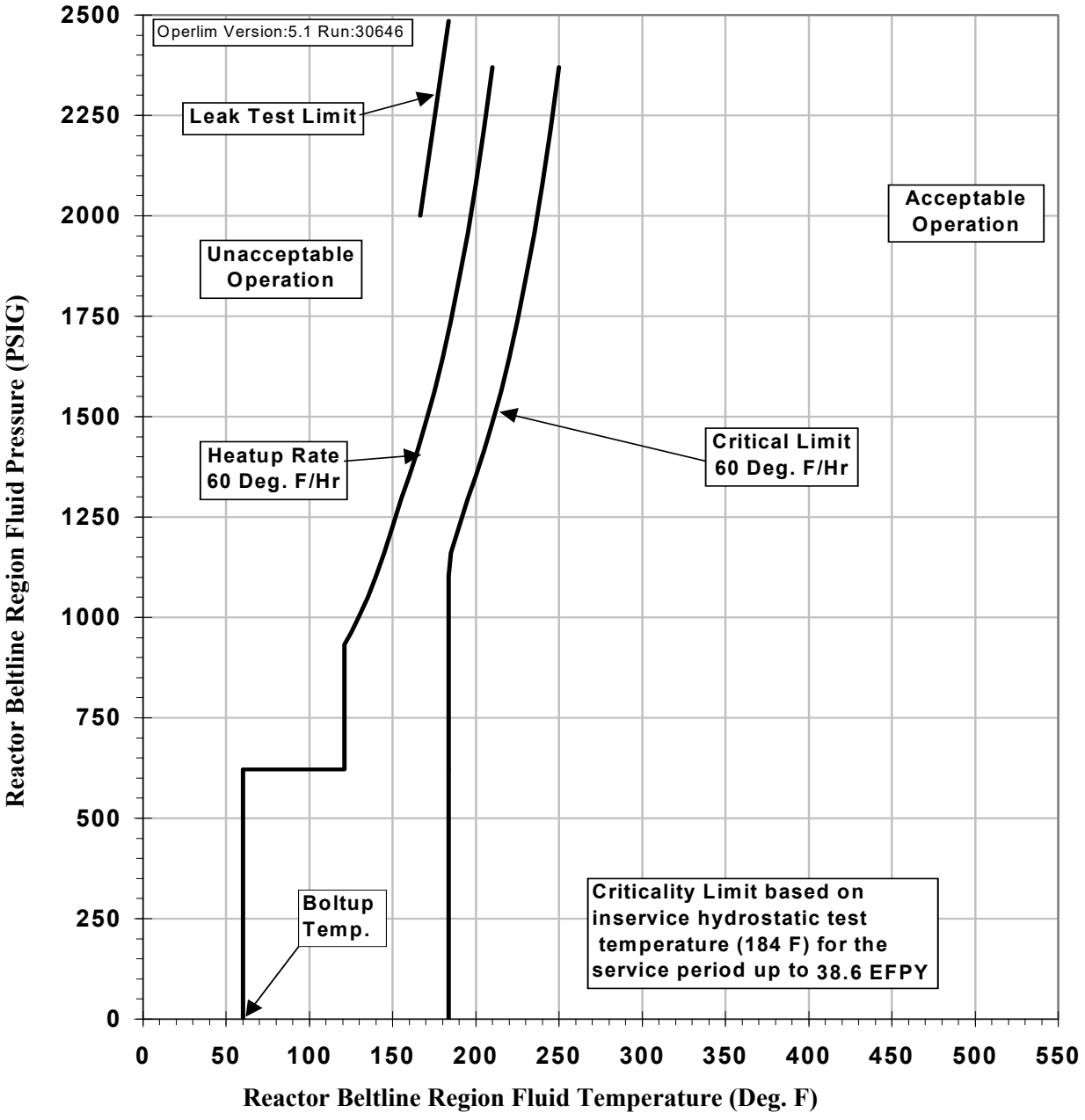

Figure 3.4.3-3 McGuire Unit 2 Reactor Coolant System Heatup Limitations (Heatup Rate of 60°F/hr) Applicable for the First 38.6 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL FORGING 04
LIMITING ART VALUES AT 38.6 EFPY: 1/4T, 123°F
3/4T, 91°F

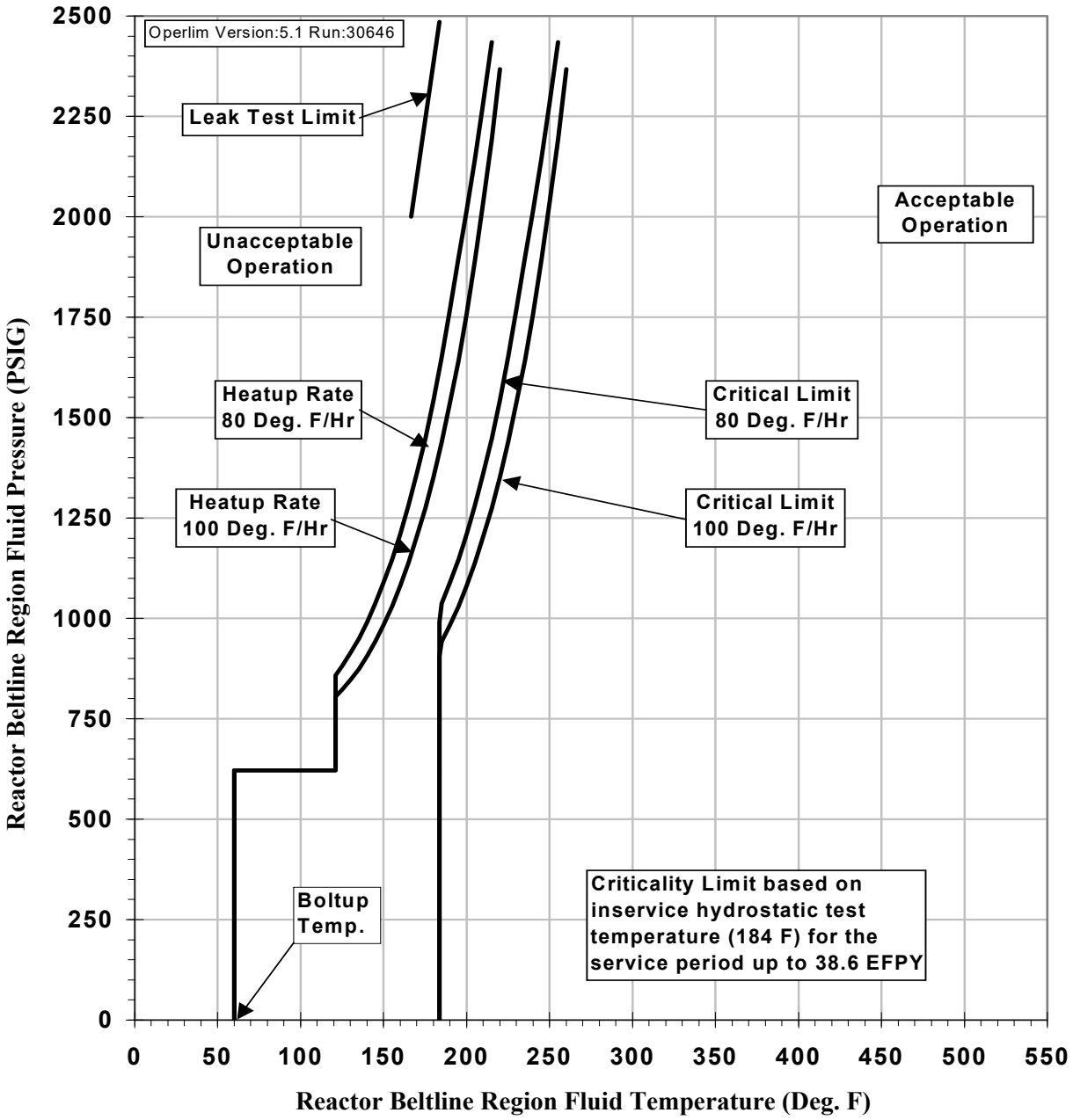

Figure 3.4.3-4 McGuire Unit 2 Reactor Coolant System Heatup Limitations (Heatup Rates of 80 & 100°F/hr) Applicable for the First 38.6 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL LONGITUDINAL WELD
LIMITING ART VALUES AT 54 EFPY: 1/4T, 202°F
3/4T, 146°F

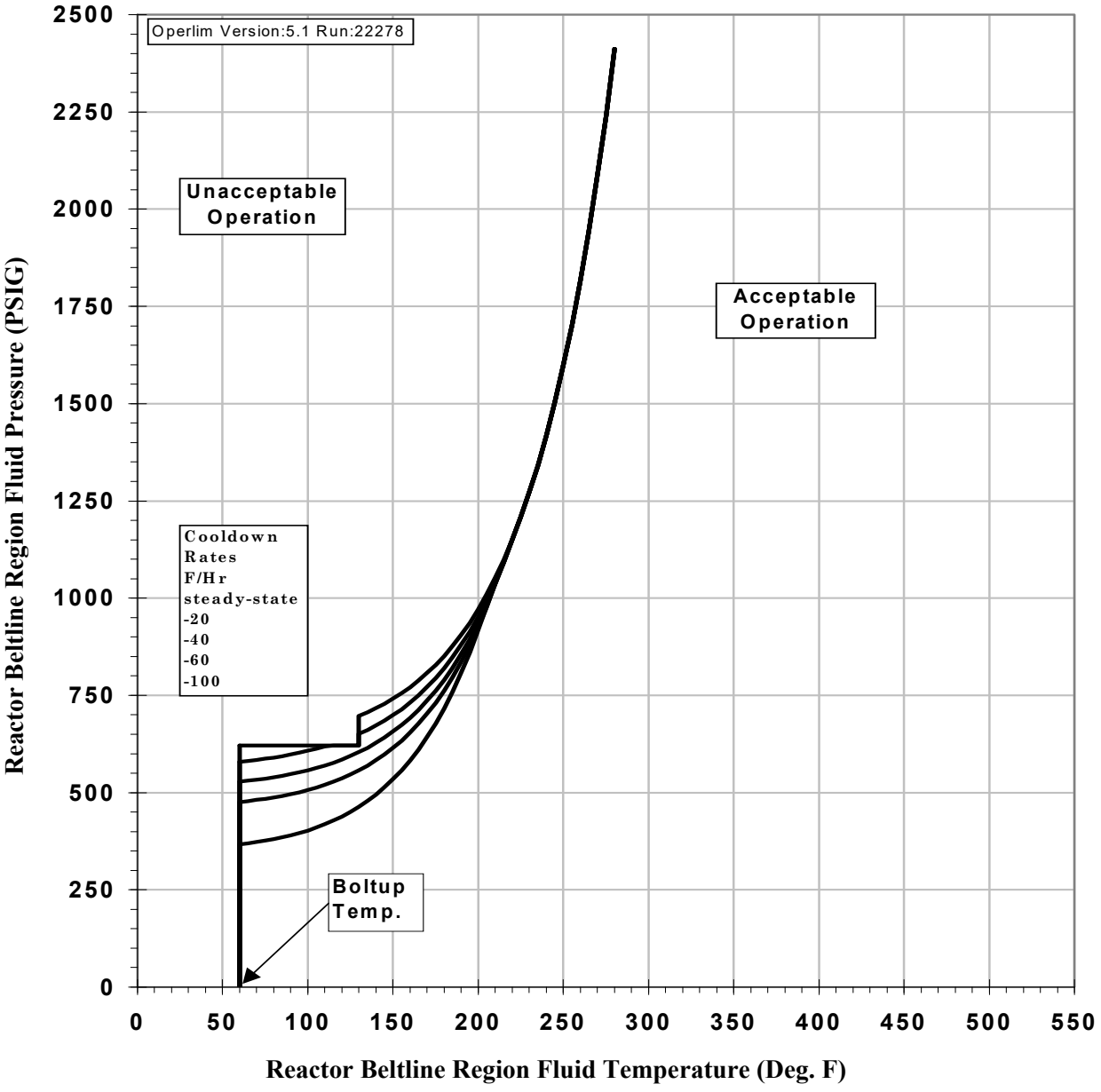

Figure 3.4.3-5 McGuire Unit 1 Reactor Coolant System Cooldown Limitations (Cooldown Rates up to 100°F/hr) Applicable for the First 54 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

MATERIAL PROPERTY BASIS

LIMITING MATERIAL: LOWER SHELL FORGING 04
LIMITING ART VALUES AT 38.6 EFPY: 1/4T, 123°F
3/4T, 91°F

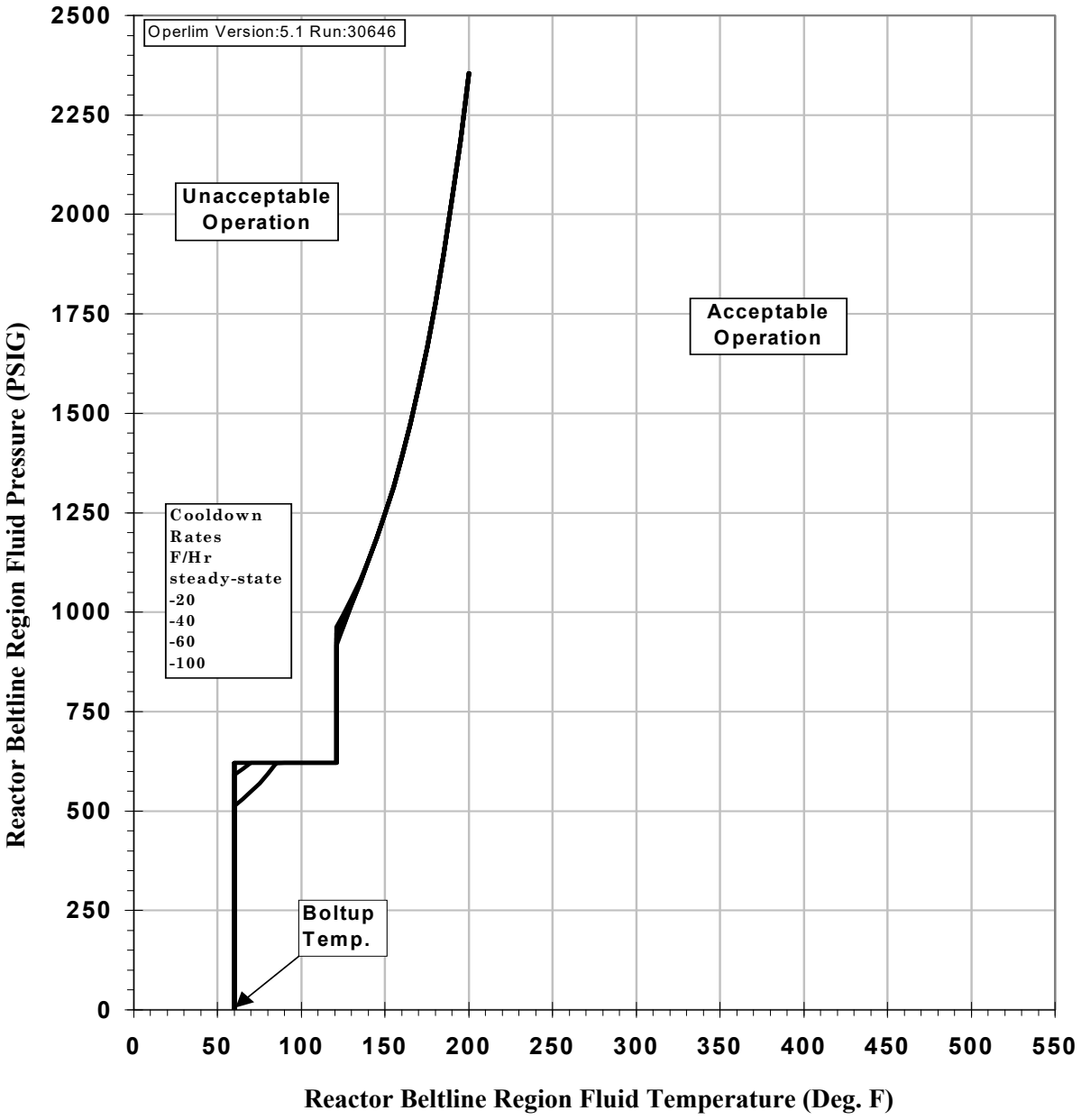

Figure 3.4.3-6 McGuire Unit 2 Reactor Coolant System Cooldown Limitations (Cooldown Rates up to 100°F/hr) Applicable for the First 38.6 EFPY (Without Margins for Instrumentation Errors) Using 1996 App.G Methodology & ASME Code Case N-641

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 326 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-9

AND AMENDMENT NO. 305 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-17

DUKE ENERGY CAROLINAS, LLC

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By application dated December 20, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21355A362), Duke Energy Carolinas, LLC (Duke Energy, the licensee), submitted a license amendment request (LAR) that requested changes to the technical specifications (TSs) for McGuire Nuclear Station, Units 1 and 2 (McGuire Units 1 and 2).

The proposed changes would revise TS 3.4.3, "RCS [Reactor Coolant System] Pressure and Temperature (P/T) Limits," to reflect changes to Figures 3.4.3-1, 3.4.3-2, and 3.4.3-5 for Unit 1 to increase limits from 34 effective full power years (EFPY) to 54 EFPY, and Figures 3.4.3-3, 3.4.3-4, and 3.4.3-6 for Unit 2 to increase limits from 34 EFPY from 34 to 38.6 EFPY during RCS heatup and cooldown, criticality, and inservice leak and hydrostatic testing.

2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC, the Commission) established requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," to protect the integrity of the reactor coolant pressure boundary in nuclear power plants. The NRC staff evaluated the acceptability of a facility's proposed P/T limits based on the following NRC regulations and guidance.

2.1 Applicable Regulations

The regulations in 10 CFR 50.36, "Technical specifications," paragraph (a)(1), require that each operating license application for a production or utilization facility include proposed TSs and a summary statement of the bases for such specifications.

The regulations in 10 CFR 50.36(c) require, in part, that TSs include the following categories related to facility operation: (1) safety limits, limiting safety systems settings, and control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls.

The regulations in 10 CFR 50.60, "Acceptance criteria for fracture prevention measures for light-water nuclear power reactors for normal operation," require that all light-water nuclear power reactors meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary set forth in 10 CFR Part 50, Appendices G, "Fracture Toughness Requirements," and H, "Reactor Vessel Material Surveillance Program Requirements."

The regulations in 10 CFR Part 50, Appendix G, require: (1) demonstration of fracture toughness for reactor pressure vessel (RPV) pressure-retaining ferritic-materials and provide adequate margins of safety during system hydrostatic tests and any condition of normal operation including anticipated operational occurrences, and (2) pressure-temperature limits and minimum temperature requirements, to which the pressure boundary may be subjected over its service lifetime.

The regulations in 10 CFR Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements," require a material surveillance program to monitor fracture toughness properties of ferritic materials in the reactor vessel beltline region which result from exposure of these materials to neutron irradiation and the thermal environment.

Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 14, "Reactor coolant pressure boundary," states that:

> The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

Appendix A to 10 CFR Part 50, GDC 30, "Quality of reactor coolant pressure boundary," states that:

> Components which are part of the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested to the highest quality standards practical. Means shall be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage.

Appendix A to 10 CFR Part 50, GDC 31, "Fracture prevention of reactor coolant pressure boundary," states that:

> The reactor coolant pressure boundary shall be designed with sufficient margin to assure that when stressed under operating, maintenance, testing, and postulated accident conditions (1) the boundary behaves in a nonbrittle manner and (2) the probability of rapidly propagating fracture is minimized.

The design shall reflect consideration of service temperatures and other conditions of the boundary material under operating, maintenance, testing, and postulated accident conditions and the uncertainties in determining (1) material properties, (2) the effects of irradiation on material properties, (3) residual, steady state and transient stresses, and (4) size of flaws.

2.2 Applicable Guidance

Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988 (ML003740284), describes general procedures acceptable to the NRC staff for calculating neutron radiation embrittlement of low-alloy steels used in light-water-cooled reactor vessels, including the adjusted reference temperature (ART) and adjusted nil-ductility transition reference temperature RT_{NDT} (ART).

RG 1.190, Revision 0, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," March 2001, (ML010890301), describes calculation methods and measurement procedures acceptable to the NRC staff for determining RPV neutron fluence. This guide is intended to ensure the accuracy and reliability of fluence determination required by 10 CFR Part 50 Appendix A, GDC 14, 30, and 31.

Regulatory Issue Summary (RIS) 2014-11, "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components," dated October 14, 2014 (ML14149A165) provides guidance on the scope and detail of information that should be provided in RPV fracture toughness and associated licensing applications to facilitate NRC staff review. Discussion includes P/T limits, P/T curves, and P/T limits reports, and consideration of neutron fluence and structural discontinuities in the development of P/T curves.

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP), Section 5.3.2, Revision 2, "Pressure-Temperature Limits, Upper-Shelf Energy, and Pressurized Thermal Shock," March 2007 (ML070380185), provides an acceptable method for determining the P/T curves based on 10 CFR Part 50, Appendix G, and the methodology of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Appendix G.

WCAP-14040-A, Revision 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves" (ML050120209), May 2004, provides the concept of the pressure and temperature limit report (PTLR) including a methodology for RPV P/T limit curve development.

3.0 TECHNICAL EVALUATION

3.1 Background

The ASME Code, Section XI, Appendix G methodology for generating P/T limit curves is based upon the principles of linear elastic fracture mechanics. The basic parameter of this methodology is the stress intensity factor (K_I), which is a function of the stress state in the component and flaw configuration. The ASME Code, Section XI, Appendix G, requires a safety factor of 2.0 on stress intensities resulting from the reactor pressure during normal and transient operating conditions, and a safety factor of 1.5 on these stress intensities for hydrostatic and pressure testing limits.

ASME Code, Section XI, Appendix G, specifies that the P/T limits be generated by postulating a flaw with a depth that is equal to 1/4 of the RPV shell thickness and a length equal to 1.5 times the RPV section thickness. The critical locations in the RPV shell thickness (T) for calculating heatup and cooldown P/T limit curves are the 1/4T and 3/4T locations, which correspond to the maximum depth of the postulated inside surface and outside surface defects, respectively.

The P/T limit curve calculations are based, in part, on the reference nil-ductility temperature (RT_{NDT}) for the material, as specified in the ASME Code, Section XI, Appendix G. The RT_{NDT} is the critical parameter for determining the critical or reference stress intensity factor (fracture toughness, K_{IC}) for the material. As required by 10 CFR Part 50, Appendix G, RT_{NDT} values for materials in the RPV beltline region shall be adjusted to account for the effects of neutron radiation. RG 1.99, Revision 2, contains methodologies for calculating the ART due to neutron irradiation. The ART is defined as the sum of the initial (unirradiated) reference nil-ductility temperature (initial RT_{NDT}), the mean value of the shift in reference temperature caused by irradiation (ΔRT_{NDT}), and a margin term. The ΔRT_{NDT} is a product of a chemistry factor (CF) and a fluence factor. The CF is dependent upon the amount of copper (Cu) and nickel (Ni) in the material and may be determined from the tables in RG 1.99, Revision 2, or from surveillance data. The fluence factor is dependent upon the neutron fluence at the postulated flaw depths described above. The margin term is dependent upon whether the initial RT_{NDT} is a plant-specific or a generic value and whether the CF was determined using the tables in RG 1.99, Revision 2, or surveillance data. The margin term is used to account for uncertainties in the values of the initial RT_{NDT}, the Cu and Ni contents, the neutron fluence and the calculational procedures.

To satisfy the requirements of 10 CFR Part 50, Appendix G, methods for determining neutron fluence are necessary to estimate the fracture toughness of the RPV materials. Appendix H to 10 CFR Part 50, requires the installation of surveillance capsules, including material test specimens and flux dosimeters, to monitor changes in fracture toughness.

3.2 NRC Staff Evaluation

The licensee's current P/T limit curves for 34 EFPYs were approved by the NRC in License Amendment Nos. 214 and 195 for McGuire, Units 1 and 2, respectively, dated July 3, 2003 (ML031780107) and were estimated to reach that level as early as the spring of 2023.

Prior to reaching 34 EFPYs, per 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," the licensee must submit updated P/T limit curves that would consider that the P/T limit curve EFPY applicability is controlled by the reactor vessel shell material ART values.

By letter dated May 16, 2013 (ML13073A041), the NRC approved a measurement uncertainty recapture (MUR) power uprate license amendment for McGuire Units 1 and 2. These amendments were inclusive of the 34 EFPY P/T limit curves, reactor vessel integrity and neutron fluence evaluations, and documented ART values based on the amendments power uprate conditions and the 34 EFPY P/T limit curves.

The LAR's proposed change references the data docketed previously in support of the issuance of the 2013 MUR amendments for McGuire. The MUR LAR documents that the limiting ART values at 54 EFPY are less than the limiting ART values used in the development of the existing Unit 1 TS P/T limit curves for 34 EFPY. As a result, at 54 EFPY, the existing limiting ART values in TS Figures 3.4.3-1, 3.4.3-2, and 3.4.3-5 remain conservative and bounding, thereby, the limiting ART values shown in these TS figures are not revised by the proposed change to adopt 54 EFPY for Unit 1.

For McGuire Unit 2, the 2013 MUR LAR docketed information also shows that the limiting ART values shown in TS Figures 3.4.3-3, 3.4.3-4, and 3.4.3-6 are not revised by the proposed change and support extension to 38.6 EFPY.

Therefore, based on previously docketed information and the fact that P/T limit curve EFPY applicability is controlled by the reactor vessel shell material ART values, the current P/T limit curves are not changed graphically; rather, their applicability is changed.

The NRC staff reviewed, the current ART values for 34 EFPY P/T limit curves and the ART values for the proposed EFPY changes and performed independent calculations to verify the licensee's ART values.

3.3 Adjusted Reference Temperature

The ART value is calculated per RG 1.99, Revision 2, and is also dependent upon the neutron fluence value and the CF, which is based on chemistry content of the reactor vessel shell material.

McGuire Unit 1

The licensee states in Attachment 3, Section 8.1.2, "[P/T] Limit Curves Applicability Evaluation," to the LAR, that the limiting ART used in determining the current McGuire Unit 1, 34 EFPY P/T limit curves was derived from (1) the surveillance data of lower shell (LS) longitudinal welds 3-442 A, B, and C (Heat # 21935/12008) for the 1/4T ART value, and (2) the 3/4T ART corresponds to the LS Plate B5013-2. For determining the McGuire Unit 1, 54 EFPY 1/4T and 3/4T ART values P/T limit curves, those values were derived from LS longitudinal welds 3-442 A, B, and C (Heat # 21935/12008) using credible Diablo Canyon Power Plant, Unit 2 (Diablo Canyon Unit 2), surveillance data (Position 2.1). The licensee used, and the NRC staff verified, that criteria as specified in RG 1.99, Revision 2, to demonstrate the credibility of the Diablo Canyon Unit 2 surveillance data, Position 2.1 were applied. RG 1.99, Revision 2, criteria that were applied and verified by the staff includes (1) the use of controlling surveillance materials with regard to radiation embrittlement; (2) scatter in the plots of Charpy energy versus temperature for the irradiated and unirradiated conditions, which should be small to determine the 30 ft-lb temperature and upper-shelf energy (USE); (3) the scatter of the ΔRT_{NDT} value, which should follow the guidance of RG 1.99, Revision 2; and (4) the irradiation temperature of the Charpy specimens in the surveillance capsule, which should match the vessel wall temperature at the cladding/base metal interface within +/- 25 degrees Fahrenheit (°F).

The CF in the context of P/T curve calculation is related to the Cu and Ni contents of the RPV shell material. The Cu and Ni values of the RPV shell material are obtained from vessel purchase order records, certified material test reports, or from values previously approved by the NRC staff. The licensee calculated the CFs for all RPV materials relevant to P/T curves based on the requirements of RG 1.99, Revision 2.

For its evaluation, the staff reviewed these values and focused on the ART calculation for the limiting material -- i.e., the LS longitudinal weld 3-442 A, B, C with Heat # 21935/12008 (Note: the limiting 1/4T ART value stated above is the major component of ART that bounds and dominates the P/T curves).

In Attachment 3, Section 3.1, "McGuire Unit 1," Table 3.1-1, "Material Properties for the McGuire Unit 1 Reactor Vessel," to the LAR, the licensee states that the chemical composition of Cu and Ni in weld 3-442 for McGuire Unit 1 is 0.213 weight % and 0.867 weight %, respectively. The Diablo Canyon Unit 2, surveillance capsules contain the same Cu and Ni contents. Because the Diablo Canyon Unit 2, weld Heat # 21935/12008 is credible and applicable to McGuire Unit 1, the licensee used Regulatory Position C.2.1 of RG 1.99, Revision 2, to calculate the CF for weld Heat # 21935/12008 for 54 EFPY. The licensee calculated a CF of 186.4 °F based on Diablo Canyon's data (Attachment 3 to the LAR, Table 5.1-3, "Summary of McGuire Unit 1 Positions 1.1 and 2.1 Chemistry Factors"). The licensee also used a 1/4T fluence of 1.269E19 n/cm^2 for the 54 EFPYs and obtained a value of 198.8 ˚F (Attachment 3 to the LAR, Table 7.1-1, "McGuire Unit 1 Predicted Positions 1.2 and 2.2 USE Values at 54 EFPY," and Table 8.1-3, "Calculation of the McGuire Unit 1 ART values at the 1/4T Location for 54 EFPY," respectively). The NRC staff verified the licensee's ΔRT_{NDT} value to be correct using guidance of RG 1.99, Revision 2.

The NRC staff reviewed the initial RT_{NDT} data in McGuire Unit 1, as shown in WCAP-15192, "McGuire Unit 1 Heatup and Cooldown Limit Curves for Normal Operation" (ML023610223, Enclosure 4) and Attachment 3 to the LAR. The NRC staff verified that the initial RT_{NDT} values used for the RPV ΔRT_{NDT} material in the P/T curves are not changed between the analyses performed for the 34 EFPY P/T curves and the values in Attachment 3 to the LAR. The NRC staff noted that the initial RTNDT for Heat # 21935/12008 is – 50 ˚F in the McGuire Unit 1 (Attachment 3 to the LAR, Table 8.1-3), and Diablo Canyon Unit 2 surveillance data.

Because the Diablo Canyon Unit 2 surveillance data was verified credible by NRC staff utilizing the acceptance criteria in RG 1.99, Revision 2, the licensee calculated a margin term of 28 ˚F. The staff noted that for the existing P/T limit curves, which were developed without using the Diablo Canyon surveillance data, the licensee used a margin of 56 ˚F as specified in RG 1.99, Revision 2.

Combining the initial RT_{NDT}, ΔRT_{NDT}, and margin, the licensee calculated a limiting ART value for weld Heat # 21935/12008 of 177 °F for the 1/4T location and 123 ˚F for the 3/4T location at 54 EFPY for McGuire Unit 1, P/T limit curves using Diablo Canyon Unit 2 surveillance data (see Attachment 3 to the LAR, Tables 8.1-3 and 8.1-4, "Calculation of the McGuire Unit 1 ART Values at the 3/4T Location for 54 EFPY").

As a comparison, the current 34 EFPY P/T limit curves for McGuire Unit 1, have limiting ART values at 1/4T and 3/4T locations of 202 ˚F and 146 ˚F, respectively for the LS longitudinal weld 3-442 A, B, and C with Heat # 21935/12008 as shown in Figure 3.4.3-1 of the LAR . Because the limiting ART values at 54 EFPY are less than the ART values of existing 34 EFPY curves, the 34 EFPY P/T curves are applicable to be used up to 54 EFPY. The NRC staff noted that one of the reasons that the ART values for 54 EFPY are lower than that of 34 EFPY is because of the lower margin term.

The NRC staff reviewed ART values of the McGuire Unit 1 RPV materials for 54 EFPY that are presented in Tables 8.1-3 and 8.1-4 of Attachment 3 to the LAR. The NRC staff determined that the licensee has used the appropriate neutron fluence values and CFs to calculate the ΔRT_{NDT} for the reactor vessel materials. The staff further determined that the licensee used the appropriate margin value as directed in RG 1.99, Revision 2, by verifying that the licensee's calculations are based on the creditable surveillance data from Diablo Canyon Unit 2.

McGuire Unit 2

For the existing 34 EFPY P/T limit curves at McGuire Unit 2, the limiting ART values at 1/4T and 3/4T locations are 123 ˚F and 91 ˚F as shown in Attachment 1 to the LAR, which also states that the limiting material is the LS forging 04.

The NRC staff evaluated McGuire Unit 2, ART values differently from that of McGuire Unit 1, because Unit 1 utilized Diablo Canyon Unit 2 weld surveillance data that affect the selection of the limiting RPV material for the McGuire Unit 1, P/T limit curves whereas Unit 2, as discussed below, did not use that method. The limiting RPV material is the material that has the highest (i.e., limiting) ART value.

For McGuire Unit 2, the licensee analyzed the weld surveillance data (Heat # 895075) from McGuire Unit 2, and sister plants Catawba Nuclear Station, Unit 1 (Catawba Unit 1) and Watts Bar Nuclear Plant, Unit 1 (Watts Bar Unit 1), in Attachment 3, Section 4.2, "Surveillance Data," to the LAR. However, the RPV weld Heat # 895075 at McGuire Unit 2, is not the limiting material because the ART value is lower than the ART value of forging 04 as stated in Attachment 3, Section 8.2, "McGuire Unit 2," to the LAR. Therefore, for the McGuire Unit 2 review, the NRC staff evaluated the ART value of LS forging 04.

The licensee used Regulatory Position C.1.1 of RG 1.99, Revision 2, to calculate a CF of 115.8 ˚F based on the Cu and Ni contents of the LS forging 04 as shown in Attachment 3, Table 8.2-1, "Calculation of the McGuire Unit 2 ART Values at the 1/4T Location for 34 EFPY," to the LAR. The licensee also used Regulatory Position C.1.1 to calculate the margin of 34 ˚F for the LS forging 04 as shown in Table 8.2-1. The initial RT_{NDT}, for LS forging 04 is -30 ˚F as stated in Table 8.2-1. The licensee calculated a ΔRT_{NDT} of 115.8 ˚F at the 1/4T location and 83.3 ˚F at the 3/4T location as shown in Attachment 3, tables 8.2-1 and 8.2-2, "Calculation of the McGuire Unit 2 ART Values at the 3/4T Location for 34 EFPY," to the LAR, respectively. In Attachment 3 to the LAR, the licensee states that with the MUR power uprated conditions, it calculated the limiting ART values for 34 EFPYs at 1/4T and 3/4T locations to be 120 ˚F and 87 ˚F, respectively. These ART values at the power uprated conditions are lower than and are bounded by the ART values for the existing P/T limit curves. Therefore, the existing McGuire Unit 2 P/T limit curves remain valid through 34 EFPY. However, the neutron fluence value used to calculate the ART values at the power uprated conditions are slightly higher than the existing ART. In its LAR, the licensee compared the neutron fluence value that was used to calculate the ART value for the limiting material (lower shell forging 04) in the current Unit 2 P/T limit curves to the neutron fluence values that were projected based on the power uprated conditions (as shown in Table 2-3, "McGuire Unit 1 Calculated Neutron Fluence Projections at the Reactor Vessel Clad/Base Metal Interface at 34, 40, 48, and 54 EFPY," LAR, Attachment 3). Based on its comparison, the licensee was able to demonstrate that the existing Unit 2 P/T curves are applicable for additional EFPYs.

The inside surface neutron fluence used to calculate the limiting ART of the existing P/T curves was 1.85E19 n/cm^2 as shown in Table 6 of WCAP-15201, Revision 2, "McGuire Unit 2 Heatup and Cooldown Limit Curves for Normal Operation," dated September 2002 (ML023610223, Enclosure 4). Table 2-5, "McGuire Unit 2 Calculated Neutron Fluence Projections at the Reactor Vessel Clad/Base Metal Interface at 34, 40, 48, and 54 EFPY," of WCAP-17455 (Attachment 3 to the LAR) provides fluence values for 30 EFPY and 40 EFPY under the power uprated conditions. Interpolating the fluence value of 1.85E19 n/cm^2 between the fluence values that corresponding to 30 EFPY and 40 EFPY, the licensee calculated the 38.6 EFPY corresponding to the fluence value of 1.85E19 n/cm^2 as stated on page 8-17 of Attachment 3 to the LAR. The NRC verified that 38.6 EFPYs corresponds to 1.85E19 n/cm^2 based on independent calculations. Therefore, because 1.85E19 n/cm^2 corresponds to the limiting ART of the existing P/T curves, the NRC staff confirmed that the existing P/T limit curves are applicable to 38.6 EFPYs.

In calculating the ART values of RPV materials, the NRC staff noted that the licensee considered surveillance data from Catawba Unit 1 and Watts Bar Unit 1 for weld Heat # 895075 credible as discussed in Section A.2 of Attachment 3 to the LAR . However, the NRC staff determined that the ART calculated for weld Heat # 895075 is not limiting. Therefore, the consideration of the Catawba, Unit 1 and Watts Bar, Unit 1 surveillance data does not affect the limiting ART values calculated for LS forging 04.

The NRC staff reviewed ART values of the McGuire Unit 2 RPV materials for 34 EFPY that are presented in Attachment 3, Tables 8.2-1 through 8.2-4 to the LAR. The NRC staff determined that the licensee applied the appropriate neutron fluence values and CFs to calculate the ΔRT_{NDT} for the limiting reactor vessel material (i.e., LS forging 04). The NRC staff further determined that the licensee used the appropriate margin value and initial RT_{NDT} for the LS forging 04 per the guidance in RG 1.99, Revision 2. The NRC staff also determined that the existing P/T curves are applicable to 38.6 EFPYs based on the neutron fluence calculations associated with the limiting ART value of LS forging 04.

3.3.1 McGuire, Units 1 and 2, ART Evaluation Summary

The NRC staff determined that the licensee has used the appropriate ART values of the limiting material to construct the proposed P/T limit curves for McGuire Units 1 and 2, such that irradiation embrittlement of the RPV material is appropriately accounted for in the P/T curves for 54 EFPYs and 38.6 EFPYs at Units 1 and 2, respectively. The NRC staff verified that the ART values for various RPV materials in Attachment 3 to the LAR are appropriately calculated in accordance with RG 1.99, Revision 2, and are, therefore, acceptable.

3.4 P/T Curves

As noted above, the NRC approved the P/T limit curves for 34 EFPY in License Amendment Nos. 214 and 195 dated July 3, 2003, for McGuire Units 1 and 2, respectively. Based on its independent calculations, the NRC staff found that the proposed P/T limit curves were developed in accordance with the 10 CFR Part 50, Appendix G.

The requirements of 10 CFR Part 50, Appendix G, specify that P/T limits be developed to bound all ferritic materials in the RPV. Further, the guidance in RIS 2014-11 states that P/T limit calculations for ferritic RPV materials, other than those materials with the highest reference temperature, may define P/T curves that are more limiting because the consideration of stress levels from structural discontinuities (such as RPV inlet and outlet nozzles) which may produce a lower allowable pressure. In its LAR, the licensee stated that the RPV nozzle P/T limits are bounded by the beltline curves. Based on its review of the neutron fluence at various nozzles, as stated in Section 2, "Calculated Neutron Fluence," of Attachment 3 to the LAR, the NRC staff determined that (1) the licensee had considered the structural discontinuities of nozzles attached to the RPV and (2) that the P/T limit curves developed for the RPV nozzles are bounded by the proposed P/T limit curves for the beltline region. Therefore, the proposed P/T limit curves for McGuire Units 1 and 2 are acceptable.

The NRC staff noted that the licensee used ASME Code Case N-641, "Alternative Pressure-Temperature Relationship and Low Temperature Overpressure Protection System Requirements, Section XI, Division 1," in the development of the existing P/T limit curves, which is permitted for generic use as shown in RG 1.147, Revision 20, "Inservice Inspection Code Cases Acceptability, ASME Section XI, Division 1," dated December 2021 (ML21181A222). Based on the ART calculations stated in the LAR, the NRC staff finds that the proposed P/T limit curves satisfy GDC 14, GDC 30, and GDC 31 because the proposed P/T limit curves limit the stresses on the reactor vessel material to protect the reactor vessel from potential leakage and gross rupture. The NRC staff verified that, based on its independent calculations, the LAR's proposed P/T limit curves for McGuire Units 1 and 2 are applicable and acceptable to 54 EFPY and 38.6 EFPY, respectively.

3.5 Neutron Fluence Calculations

The methods used to determine the fluence values for the LAR's proposed changes are stated in Section 2 of Attachment 3 to the LAR. The licensee further states that the fluence calculations were performed consistent with the methods described in WCAP-14040-A, Revision 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves" (ML050120209). In the NRC staff safety evaluation that established the acceptability and conditions of its approval of WCAP-14040-A, Revision 4. the NRC staff noted that the calculational methods and benchmarking were adherent to the guidance in RG 1.190 and are, therefore, acceptable.

With the WCAP-14040-A fluence methods stated as acceptable and adherent to RG 1.190, the NRC staff also considered whether these methods are applicable to McGuire. McGuire, 4-loop Westinghouse pressurized water reactors (PWRs), had its reactor geometry represented within the generic qualification database that supported the fluence methods described in WCAP-14040-A. Further, in Appendix C, "Validation of the Radiation Transport Models Based on Neutron Dosimetry Measurements," of Attachment 3 to the LAR, the licensee provides a plant-specific qualification of the fluence estimates based on McGuire and its capsule dosimetry which states that,

> In the case of the direct comparison of measured and calculated sensor reaction rates, the M/C [measured-to-calculated] comparisons for fast neutron reactions range from 0.87 to 1.21 for the 30 samples included in the McGuire Unit 2 data set. The overall average M/C ratio for the entire set of McGuire Unit 2 data is 1.03 with an associated standard deviation of 9.2%.

> Similarly for McGuire Unit 1, the M/C comparisons for fast neutron reactions range from 0.82 to 1.22 for the 27 samples included in the data set. The overall average M/C ratio for the entire set of Unit 1 data is 1.03 with an associated standard deviation of 10.5%.

According to RG 1.190, a fluence method is acceptable for use in downstream calculations used to determine the PT limits if the calculated values agree with dosimetry comparisons within ± 20 percent. The above excerpt indicates that, in aggregate, this criterion is satisfied. Additionally, the range of M/C values for each unit included one M/C ratio that exceeded 20 percent. For Unit 2, this was for a uranium dosimeter in a single capsule (M/C ratio 1.21), and for Unit 1, this was for a neptunium dosimeter in a single capsule (M/C 1.22). However, because these ratios represent single comparisons in a larger set of data, including several acceptable comparisons for the same dosimeters from other capsules at both units, the NRC staff considers the M/C comparisons to be acceptable because of the stated consistency with RG 1.190.

Based on the above, the NRC determine that the licensee (1) used an acceptable method to calculate the neutron fluence, and (2) demonstrated plant-specific capsule dosimetry comparisons that document these two methods both adhere to RG 1.190 guidance and are applicable to McGuire. Therefore, the NRC staff concludes that the fluence estimates are acceptable, as they provide reasonable assurance of support for the revised applicability period for the McGuire P/T limits set forth in TS 3.4.3.

3.6 Changes to Technical Specifications

The licensee's LAR proposes the following changes to the TS figures for the P/T limit curves and low temperature overpressure protection (LTOP) setpoint limit curves:

- TS Figure 3.4.3-1, "McGuire Unit 1 Reactor Coolant System Heatup Limitations (Heatup Rate of 60°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641," is revised to specify an applicability term of 54 EFPY.

- TS Figure 3.4.3-2, "McGuire Unit 1 Reactor Coolant System Heatup Limitations (Heatup Rates of 80 & 100°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641," is revised to specify an applicability term of 54 EFPY.

- TS Figure 3.4.3-3, "McGuire Unit 2 Reactor Coolant System Heatup Limitations (Heatup Rate of 60°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641," is revised to specify an applicability term of 38.6 EFPY.

- TS Figure 3.4.3-4, "McGuire Unit 2 Reactor Coolant System Heatup Limitations (Heatup Rates of 80 & 100°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641," is revised to specify an applicability term of 38.6 EFPY.

- TS Figure 3.4.3-5, “McGuire Unit 1 Reactor Coolant System Cooldown Limitations (Cooldown Rates up to 100°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641,” is revised to specify an applicability term of 54 EFPY.

- TS Figure 3.4.3-6, “McGuire Unit 2 Reactor Coolant System Cooldown Limitations (Cooldown Rates up to 100°F/hr) Applicable for the First 34 EFPY (Without Margins for Instrumentation Errors) Using 1996 App. G Methodology & ASME Code Case N-641,” is revised to specify an applicability term of 38.6 EFPY.

- The statement in each Figure, “Limiting ART values at 34 EFPY,” revises the applicability term statement for the limiting ART values (i.e., Limiting ART values at 34 EFPY) to reflect 54 EFPY for Unit 1 and 38.6 EFPY for Unit 2.

- The proposed change revises the “Criticality Limit” note in Figures 3.4.3-1, 3.4.3-2, 3.4.3-3, and 3.4.3-4, stating that the “[c]riticality limit based on the inservice hydrostatic test temperature (262 F) for the service period up to 34 EFPY,” reflect an applicability period of 54 EFPY for Unit 1 and 38.6 EFPY for Unit 2.

The proposed changes above revise the applicability term associated with the TS P/T limit curve figures while the P/T limit curves and limiting ART values remain unchanged. Based on the above, the NRC concludes the proposed changes continue to meet the requirements in 10 CFR 50.36, and are, therefore, acceptable.

3.7 Technical Conclusion

Based on the above, the NRC staff has determined that the proposed P/T limit curves are constructed based on the limiting ART, which was appropriately derived based on RG 1.99, Revision 2 and RG 1.190, Revision 2. The proposed P/T limit curves considered stresses in the reactor vessel shell materials. The NRC staff has determined that the proposed P/T limit curves in McGuire Units 1 and 2 TS Section 3.4.3 are appropriately constructed satisfying the methodology of the ASME Code, Section XI, Appendix G. The minimum temperature limits in the proposed P/T curves satisfy the requirements of 10 CFR Part 50, Appendix G and H. Accordingly, the NRC staff finds that the proposed P/T curves continue to meet the requirements of 10 CFR 50.36, 50.60, and GDC 14, 30, and 31. Based on the above evaluation, the NRC staff concludes that the proposed P/T limit curves for Units 1 and 2 are applicable to 54 EFPY and 38.6 EFPY, respectively.

4.0 STATE CONSULTATION

In accordance with the Commission’s regulations, the North Carolina State official was notified of the proposed issuance of the amendments on October 4, 2022. On October 4, 2022, the State official confirmed that the State of North Carolina had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure.

The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration published in the *Federal Register* on February 22, 2022 (87 FR 9650), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

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

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Date: November 29, 2022

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2, ISSUANCE OF AMENDMENT NOS. 326 AND 305, REGARDING CHANGES TO TECHNICAL SPECIFICATION 3.4.3, REACTOR COOLANT SYSTEM PRESSURE AND TEMPERATURE LIMITS (EPID L-2021-LLA-0232) DATED NOVEMBER 29, 2022

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