5.6 Reporting Requirements

5.6.6 PTLR (continued)

c. The analytical methods used to determine the RCS pressure and temperature and LTOP limits shall be those previously reviewed and approved by the NRC in NRC letter dated <NRC approval document>. Specifically, the methodology is described in the following documents:

1. Letter from R.C. Mecredy, Rochester Gas and Electric Corporation (RG&E), to Document Control Desk, NRC, Attention: Guy S. Vissing, "Application for Facility Operating License, Revision to Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR) Administrative Controls Requirements," Attachment VI, September 29, 1997, as supplemented by letter from R.C. Mecredy, RG&E, to Guy S. Vissing, NRC, "Corrections to Proposed Low Temperature Overpressure Protection System Technical Specification," October 8, 1997.

2. WCAP-14040-NP-A, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," Sections 1 and 2, January, 1996.

d. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluence period and for revisions or supplement thereto.

5.6 Reporting Requirements

5.6.6 PTLR (continued)

c. The analytical methods used to determine the RCS pressure and temperature and LTOP limits shall be those previously reviewed and approved by the NRC~~. The acceptability of the P/T and LTOP limits are documented~~ in NRC letter dated ~~May 23, 1996~~ <NRC approval document>. Specifically, the ~~limits and~~ methodology ~~are~~is described in the following documents:

1. Letter from R.C. Mecredy, Rochester Gas and Electric Corporation (RG&E), to Document Control Desk, NRC, Attention: ~~A.R. Johnson~~Guy S. Vissing, "Application for Facility Operating License, Revision to Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR) Administrative Controls Requirements," Attachment VI, September 29, 1997, as supplemented by letter from R.C. Mecredy, RG&E, to Guy S. Vissing, NRC, "Corrections to Proposed Low Temperature Overpressure Protection System Technical Specification," October 8, 1997.

2. ~~Letter from C.I. Grimes, NRC, to R.A. Newton, Westinghouse Electric Corporation, "Acceptance for Referencing Topical Report WCAP-14040, Revision 1~~ NP-A "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," ~~October 16, 1995~~ Sections 1 and 2, January, 1996.

~~3. Letter from R.C. Mecredy, Rochester Gas and Electric Corporation (RG&E), to Document Control Desk, NRC, Attention A.R. Johnson, "Technical Specifications Improvement Program, Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR)," December 8, 1995.~~

d. The PTLR shall be provided to the NRC upon issuance for each reactor vessel fluence period and for revisions or supplement thereto.

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. All changes to these limits must be developed using the NRC approved methodologies specified in Technical Specification 5.6.6. These limits have been determined such that all applicable limits of the safety analysis are met. All items that appear in capitalized type are defined in Technical Specification 1.1, "Definitions."

2.1 RCS Pressure and Temperature Limits (LCO 3.4.3 and LCO 3.4.12) (Reference 1)

2.1.1 The RCS temperature rate-of-change limits are:

a. A maximum heatup of 60°F per hour.

b. A maximum cooldown of 100°F per hour.

2.1.2 The RCS P/T limits for heatup and cooldown are specified by Figures 1 and 2, respectively.

2.1.3 The minimum boltup temperature, using the methodology of Reference 4, Enclosure 2 is 60°F.

2.2 Low Temperature Overpressure Protection System Enable Temperature (LCOs 3.4.6, 3.4.7, 3.4.10 and 3.4.12) (Methodology of Reference 3, Attachment VI and Reference 6, as calculated in Reference 7).

2.2.1 The enable temperature for the Low Temperature Overpressure Protection System is 322°F.

2.3 Low Temperature Overpressure Protection System Setpoints (LCO 3.4.12)

2.3.1 Pressurizer Power Operated Relief Valve Lift Setting Limits (Methodology of Reference 3, Attachment VI and Reference 6, as calculated in Reference 3, Attachment VII).

The lift setting for the pressurizer Power Operated Relief Valves (PORVs) is $\leq$ 411 psig (includes instrument uncertainty).

Table 3 shows calculations of the surveillance material chemistry factors using surveillance capsule data.

Table 4 provides the reactor vessel toughness data.

Table 5 provides a summary of the fluence values used in the generation of the heatup and cooldown limit curves.

Table 6 shows example calculations of the ART values at 24 EFPY for the limiting reactor vessel material.

5.0 REFERENCES

1. WCAP-14684, "R.E. Ginna Heatup and Cooldown Limit Curves for Normal Operation," dated June 1996.

2. WCAP-14040-NP-A, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," Revision 2, January 1996.

3. Letter from R.C. Mecredy, RG&E, to Guy S. Vissing, NRC, Subject: "Application for Amendment to Facility Operating License, Revision to Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR) Administrative Controls Requirements," dated September 29, 1997.

4. Letter from R.C. Mecredy, RG&E, to Guy S. Vissing, NRC, "Clarifications to Proposed Low Temperature Overpressure Protection System Technical Specification," dated June 3, 1997.

5. WCAP-7254, "Rochester Gas and Electric, Robert E. Ginna Unit No. 1 Reactor Vessel Radiation Surveillance Program," May 1969.

6. Letter from R.C. Mecredy, RG&E, to Guy S. Vissing, NRC, "Corrections to Proposed Low Temperature Overpressure Protection System Technical Specification," October 8, 1997.

7. RG&E Design Analysis DA-ME-97-031, "Evaluation of Ginna RCS Coolant Temperature to Support LTOPS Requirements," Revision 0.

~~coolant temperatures corresponding to a reactor vessel metal temperature less than RT_{NDT} + 50°F,~~ whichever is greater. RT_{NDT} is the highest adjusted reference temperature for weld or base metal in the beltline region at a distance one-fourth of the vessel section thickness from the vessel inside surface, as determined by Regulatory Guide 1.99, Revision 2. ~~Although expected soon, use of Code Case N-514 has not yet been formally approved by the NRC. In the interim, an exemption to the regulations must be granted by the NRC before Code Case *N-514 can be used in the determination of the LTOPS setpoint(s) and enable temperature.~~

3.4 Enable Temperature for LTOPS

The enable temperature is the temperature below which the LTOPS system is required to be operable.

The Ginna LTOPS enable temperature is established using the guidance provided by ASME XI Code Case N-514. The ASME Code Case N-514 supports an enable RCS liquid temperature corresponding to the reactor vessel 1/4t metal temperature of RT_{NDT} + 50°F or 200°F. ~~The definition of the enabling temperature currently approved and supported by the NRC is described in Branch Technical Position RSB 5-2[18]. This position defines the enable temperature for LTOP systems as the water temperature corresponding to a metal temperature of at least RT_{NDT} + 90°F at the beltline location (1/4t or 3/4t) that is controlling in the Appendix G limit calculations. This definition is mostly based on material properties and fracture~~

~~mechanics, with the understanding that material temperatures of RT_{NDT} + 90°F at the critical location will be well up the transition curve from brittle to ductile properties, and therefore brittle fracture of the vessel is not expected.~~

~~The ASME Code Case N-514 supports an enable temperature of RT_{NDT} + 50°F or 200°F,~~ whichever is greater as described in Section 3.3. This definition is also supported by the Westinghouse Owner's Group. The Ginna enable temperature is determined as (RT_{NDT} + 50°F) + (instrument error[20]) + (metal temperature difference to 1/4 T). The maximum allowable pressure is 110% of the steady-state cooldown curve calculated in accordance with Appendix G to 10CFR50[4] per ASME Code Case N-514[21]. ~~This definition is also supported by Westinghouse and can be used by requesting an exemption to the regulations or when ASME Code Case N-514 is formally approved by the NRC.~~

The RCS cold leg temperature limitation for starting an RCP is the same value as the LTOPS enable temperature to ensure that the basis of the heat injection transient is not violated. The ~~Standard~~ Technical Specifications ~~(STS)~~ prohibit starting an RCP when any RCS cold leg temperatures is less than or equal to the LTOPS enable temperature unless the secondary side water temperature of each steam generator is less than or equal to 50°F above each of the RCS cold leg temperatures, or the pressurizer water volume is < 324 cubic feet (38% level).

curve (with 10% additional margin) as calculated in accordance with Appendix G to 10CFR50[4] or the peak RCS or RHR System pressure based upon piping/structural analysis loads. The lower pressure extreme is specified by the reactor coolant pump #1 seal minimum differential pressure performance criteria. Uncertainties in the pressure and temperature instrumentation utilized by the LTOPS are accounted for consistent with the methodology of Reference 2.0. Accounting for the effects of instrumentation uncertainty imposes additional restrictions on the setpoint development, which is already based on conservative pressure limits such as a safety factor of 2 on pressure stress, use of a lower bound K_{IR} curve and an assumed ¼T flaw depth with a length equal to 1½ times the vessel wall thickness.

3.3 Application of ASME Code Case N-514

ASME Code Case N-514[17] allows LTOPS to limit the maximum pressure in the reactor vessel to 110% of the pressure determined to satisfy Appendix G, paragraph G-2215, of Section XI of the ASME Code[5]. The application of ASME Code Case N-514 increases the operating margin in the region of the pressure-temperature limit curves where the LTOPS is enabled. Code Case N-514 also requires LTOPS to be effective at coolant temperatures less than 200°F or at coolant temperatures corresponding to a reactor vessel metal temperature, at a 1/4t distance from the inside vessel surface, less than RT_{NDT} + 50°F, whichever is greater. RT_{NDT} is the highest adjusted reference temperature for weld or base metal in the beltline region at a distance one-fourth of the vessel section thickness from the vessel inside surface, as determined by Regulatory Guide 1.99, Revision 2.

3.4 Enable Temperature for LTOPS

The enable temperature is the temperature below which the LTOPS system is required to be operable.

The Ginna LTOPS enable temperature is established using the guidance provided by ASME XI Code Case N-514. The ASME Code Case N-514 supports an enable RCS liquid temperature corresponding to the reactor vessel 1/4t metal temperature of RT_{NDT} + 50°F or 200°F, whichever is greater as described in Section 3.3. This definition is also supported by the Westinghouse Owner's Group. The Ginna enable temperature is determined as (RT_{NDT} + 50°F) + (instrument error [20]) + (metal temperature difference to 1/4 T). The maximum allowable pressure is 110% of the steady-state cooldown curve calculated in accordance with Appendix G to 10CFR50[4] per ASME Code Case N-514[21]

The RCS cold leg temperature limitation for starting an RCP is the same value as the LTOPS enable temperature to ensure that the basis of the heat injection transient is not violated. The Technical Specifications prohibit starting an RCP when any RCS cold leg temperatures is less than or equal to the LTOPS enable temperature unless the secondary side water temperature of each steam generator is less than or equal to 50°F above each of the RCS cold leg temperatures, or the pressurizer water volume is < 324 cubic feet (38% level).