CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9702200011 DOC.DATE: 97/02/10 NOTARIZED: NO DOCKET #
FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
AUTH.NAME AUTHOR AFFILIATION
MECREDY,R.C. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION
VISSING,G.S.

SUBJECT: Requests exemption to 10CFR50.60 to use ASME Code Case N-514 in determination of LTOP enable temp in place of methodology currently required by 10CFR50.60.

DISTRIBUTION CODE: A047D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 7
TITLE: OR Submittal: Inservice/Testing/Relief from ASME Code - GL-89-04

NOTES:License Exp date in accordance with 10CFR2,2.109(9/19/72). 05000244

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-1 LA	1	1	PD1-1 PD	1	1
	VISSING,G.	1	1			
INTERNAL:	AEOD/SPD/RAB	1	1	FILE CENTER 01	1	1
	NRR/DE/EMEB	1	1	NUDOCS-ABSTRACT	1	1
	OGC/HDS3	1	0	RES/DET/EIB	1	1
	RES/DET/EMMEB	1	1			
EXTERNAL:	LITCO ANDERSON	1	1	NOAC	1	1
	NRC PDR	1	1			

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM OWFN 5D-5(EXT. 415-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 13 ENCL 12

CATEGORY 1 DOCUMENT

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649-0001 AREA CODE 716 546-2700

ROBERT C. MECREDY
Vice President
Nuclear Operations

February 10, 1997

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Guy S. Vissing
Project Directorate I-1
Washington, D.C. 20555

Subject: Request for Exemption to 10 CFR 50.60 to use American Society of Mechanical Engineers (ASME) Code Case N-514 in the Determination of Low Temperature Overpressure Protection (LTOP) Enable Temperature
Rochester Gas & Electric Corporation
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

References: (a) Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, *Request to Use ASME Code Case N-514 in the Determination of Low Temperature Overpressure Protection,* dated December 18, 1996.

(b) Letter from G.S. Vissing, NRC, to R.C. Mecredy, RG&E, *R.E. Ginna - Acceptance of Request to Extend Time for Approval of Revision of Pressure and Temperature Limits Report (PTLR) (TAC No. M97313),* dated December 10, 1996.

Dear Mr. Vissing:

By Reference (a), RG&E requested per 10 CFR 50.55a(a)(3) to use the ASME Section XI Code Case N-514 in lieu of 10 CFR 50.60 for calculating the LTOP enable temperature. Upon further consultation with NRC Staff, RG&E was asked to submit this request as an exemption in accorandance with 10 CFR 50.12. Therefore, included as Attachment I to this letter is a request for exemption per the criteria of 10 CFR 50.12(a)(2)(iii). This request is to allow use of ASME Code Case N-514, "Low Temperature Overpressure Protection Section XI, Division 1" (see Attachment II) in the determination of the LTOP enable temperature in place of the methodology currently required by 10 CFR 50.60. Therefore, this document supercedes that provided in Reference (a) in its entirety.

A047 1/1

The code case has been approved by the ASME based on conservatisms already included within the LTOP setpoint calculations. Approval of this exemption request is required by May 1, 1997 in order to support issuance of a revised PTLR by July 1, 1997 per Reference (b). Please contact George Wrobel, Manager of Nuclear Safety and Licensing at (716) 724-8070 if you have further questions.

Very truly yours,

Robert C. Mecredy

MDF\903

Attachments

xc: U.S. Nuclear Regulatory Commission
Mr. Guy S. Vissing (Mail Stop 14C7)
PWR Project Directorate I-1
Washington, D.C. 20555

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Ginna Senior Resident Inspector

Attachment I

Rochester Gas and Electric (RG&E) requests an exemption to 10 CFR 50.60 based on the criteria of 10 CFR 50.12(a)(2)(iii) which allows the Nuclear Regulatory Commission (NRC) to grant an exemption from the requirements of the regulations contained in 10 CFR Part 50 if compliance with the regulation results in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted. Specifically, the exemption is being requested with respect to 10 CFR 50.60 which requires that all lightwater nuclear power reactors meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary contained in 10 CFR Part 50, Appendices G and H. Appendix G Section IV.A.2.b requires that the pressure-temperature (P/T) limits and minimum temperature requirements for the reactor vessel be at least as conservative as the limits obtained through use of the methods of analysis and margins of safety of Appendix G to Section XI of the American Society of Mechanical Engineers (ASME) Code. In addition, Table 1 of Appendix G requires that 40°F be added to this value to obtain additional margin.

Included within Appendix G of ASME Section XI (see paragraph G-2215) is the determination of the low temperature overpressure protection (LTOP) system enable temperature. The LTOP system is used by plants to automatically protect the reactor coolant system boundary from Service A or B low temperature overpressure events (i.e., normal and anticipated operational occurrences) during reactor startup and shutdown operations. The enable temperature is the temperature below which the LTOP system must be in service in order to limit the maximum pressure in the reactor vessel to 110% of the pressure limit necessary to satisfy the remaining requirements of Appendix G of ASME Section XI. Appendix G of ASME Section XI specifies that the LTOP enable temperature must be 200°F, or the reactor coolant system (RCS) temperature corresponding to a reactor vessel metal temperature of RT_{NDT}[(1)] + 50°F, whichever is greater. Therefore, 10 CFR Part 50, Appendix G effectively requires a LTOP enable temperature of 240°F or RT_{NDT} + 90°F, whichever is greater (with 40°F margin included).

Based on Figures 1 and 2 contained within Reference 1, the LTOP enable temperature for Ginna Station would be 322°F (i.e., RT_{NDT} at 1/4T + 90°F). However, this does not include instrument uncertainty. That is, the NRC requires that instrument uncertainty be included beyond the 40°F margin added by 10 CFR Part 50, Appendix G to address the reactor coolant temperature "corresponding to a reactor vessel metal temperature" of RT_{NDT} + 50°F as specified in Appendix G to ASME Section XI. Based on RG&E instrument uncertainty calculations, the LTOP enable temperature for Ginna Station would be 356°F (i.e., 19°F uncertainty from RCS T_{cold} wide range indication plus estimated 15°F 1/4T to RCS fluid temperature uncertainty). This new enable temperature value creates several problems as described below.

---

(1) RT_{NDT} is defined in Regulatory Guide 1.99, Revision 2 as the highest adjusted reference temperature (for weld or base metal in the beltline region) at a distance of one fourth of the vessel section thickness (1/4T) from the vessel wetted inner surface.

The Ginna Station Improved Technical Specifications (ITS) are written around plant operating conditions (i.e., modes) for ease of use. A mode change occurs at a reactor coolant system temperature of 350°F (i.e., Mode 4 is below 350°F while Mode 3 is above 350°F). The current LTOP enable temperature (see LCO 3.4.12) is 328°F which is in Mode 4. A value of 356°F would require the LTOP system to also be operable in Mode 3 and impact LCOs 3.3.2 (ESFAS Instrumentation), 3.4.11 (Pressurizer PORVs), 3.4.12 (LTOP System), and 3.5.2 (ECCS - Modes 1, 2 and 3). Specifically, LCO 3.4.12 would have to be revised to include part of Mode 3 in its Mode of Applicability requirements, while LCOs 3.3.2, 3.4.11, and 3.5.2 would have to be revised to remove part of Mode 3 from their Mode of Applicability.

Revising the Mode of Applicability for LCOs 3.3.2, 3.4.11, and 3.5.2 has several undesirable effects. First, the ITS bases for LCO 3.4.11 state that the pressurizer PORVs are required to operable for manual operation in Modes 1, 2, and 3 to mitigate the consequences of a steam generator tube rupture (SGTR) event and prevent challenges to the pressurizer safety valves. Requiring the PORVs to be in their LTOP configuration with a lift setpoint of $\leq$ 411 psig (see Reference 1) up to a RCS temperature of 356°F provides very little operating margin during startup and shutdown conditions. While the new enable temperature does not prevent the capability of the pressurizer PORVs to mitigate a SGTR event or prevent challenges to the pressurizer safeties, it does increase the potential of an inadvertent lift of the PORVs (i.e., a PORV loss-of-coolant-accident (LOCA)). The inadvertent PORV lift is due to the limited operating margin available as RCS pressure and temperature closely follow one another under these conditions. As such, with the addition of instrument drift, a setpoint of $\leq$ 411 psig could result in a PORV lift below 400 psig (or near 356°F). In addition, there would be no margin between configuring the PORVs for LTOP conditions and for power operation conditions as currently exists (i.e., with an enable temperature of 328°F, there is a 22°F window to configure the PORVs for LTOP and power operation).

Second, LCOs 3.3.2 and 3.5.2 require the high pressure safety injection (SI) pumps (including actuation signals to the pumps) to be operable in Modes 1, 2, and 3. The SI pumps provide protection with respect to preventing a return to criticality following a main steam line break, and RCS inventory control and core cooling following a LOCA and SGTR event. LCO 3.4.12 requires that the SI pumps be incapable of injecting into the RCS whenever the PORVs are providing LTOP protection (which they would be with RCS > 350°F). The bases for SRs 3.4.12.1, 3.12.1.2, 3.4.12.3 define incapable of injecting as:

a. placing the pump control switch in the pull-stop position and closing at least one valve in the discharge flow path;

b. locking closed a manual isolation valve in the injection path; or

c. closing a motor operated isolation valve in the injection path and removing the AC power source.

While there is no specific analysis of a main steam line break, LOCA, or SGTR at a RCS temperature of 356°F since this is a non-limiting condition (versus hot zero power or full power), the accident analysis assumes that SI is available very rapidly (e.g., within 5 seconds of generating a SI signal). Implementing any one of the above three means for rendering a SI pump incapable of injection into the RCS would obviously take several minutes or even longer to provide SI injection capability. Consequently, the additional time prior to the availability of SI would have to be confirmed within the accident analysis as being acceptable. Since RG&E does not have LOCA analysis capabilities, a vendor with an approved methodology would have to be used at an expected minimum cost of $100,000 for this LOCA evaluation. Furthermore, NRC review and approval of this analysis would be costly and time-consuming.

In summary, requiring the LTOP enable temperature to be 240°F or RT_{NDT} + 90°F, whichever is greater, with an additional requirement to add relevant instrument uncertainties results in a temperature for Ginna Station that: (1) significantly increases the potential for a PORV LOCA during startup and shutdown activities, (2) requires placing the high pressure SI pumps incapable of injecting into the RCS during modes of operation when the SI pumps are currently required to be available for automatic injection (i.e., a degradation in installed safety capability), and (3) would require RG&E to re-perform the accident analysis for LOCAs, SGTRs, and main steam line breaks at significant cost. Therefore, per 10 CFR 50.12(a)(2)(iii), RG&E requests an exemption from the requirements of the regulations contained in 10 CFR 50.60 with respect to the LTOP enable temperature as a result of undue hardship. In its place, RG&E requests to use ASME Section XI, Code Case N-514, "Low Temperature Overpressure Protection Section XI, Division 1" (Attachment II) to remove the additional 40°F conserativism.

There are many conservatisms incorporated in the P/T limits calculated using the current methodology of ASME Code Section XI, Appendix G. ASME explicitly recognized the amount of margin inherent in the Appendix G P/T limits by approving Code Case N-514 on February 12, 1992 and incorporating it into the 1993 Addenda to ASME Code Section XI, Appendix G. Code Case N-514 effectively removes the 40°F margin added by 10 CFR Part 50, Appendix G such that the LTOP enable temperature would be 200°F or RT_{NDT} + 50°F, whichever is greater with relevant instrument uncertainties added. Using the same values as above, this would result in a LTOP enable temperature of 316°F for Ginna Station which is within the same operating mode as the existing enable temperature.

Following the use of ASME Code Case N-514, the LTOP system will still function to meet the fracture toughness requirements of the pressure-retaining components of the reactor coolant pressure boundary and provide adequate margin of safety during a condition of normal operation, including anticipated operational occurrences, to which the pressure boundary may be subjected over its lifetime. As such, use of Code Case N-514 will still meet the underlying purpose of 10 CFR 50.60. This code case has been granted for other licensees (Reference 2).

References:

1. Letter from R.C. Mecredy, RG&E, to G.S. Vissing, NRC, *Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR)*, dated December 30, 1996.

2. Letter from C.Y. Shiraki, NRC, to D.L. Farrar, Commonwealth Edison Company, *Exemption from Requirements of 10 CFR 50.60, Acceptance Criteria for Fracture Prevention for Lightwater Nuclear Power Reactors for Normal Operation - Zion Nuclear Power Station, Units 1 and 2 (TAC Nos M95119 and M95120)*, dated July 30, 1996.

3. Letter from G.F. Dick, NRC, to I.M. Johnson, Commonwealth Edison Co., *Exemption from Requirements of 10CFR50.60 Using Safety Margins Recommended in ASME Boiler & Pressure Vessel Code Case N-514 - Byron Station Units 1 and 2*, dated November 29, 1996.

4. Letter from D.B. Matthews, to J.P O'Hanlon, Virginia Electric & Power Co., *Exemption to 10CFR50.60 Permitting Use of Safety Margins Recommended in ASME Code Case N-514, "Low Temperature Overpressure Protection," in Lieu of Safety Margins Required by Appendix G to 10CFR50 - Surry Power Station Units 1 and 2*, dated October 31, 1995.

5. Letter from H.N. Berkow, NRC, to C.K. McCoy, Georgia Power Co., *Exemption from Requirements of 10CFR50.60, "Acceptance Criteria for Fracture Prevention for Light-Water Nuclear Power Reactors for Normal Operation," Using Safety Margins Recommended in ASME Code Case N-514 - Vogtle Nuclear Plant, Units 1 and 2*, dated June 5, 1995.

6. Letter from J.N. Hannon, NRC, to K.M. Hass, Consumers Power Co., *Exemption from Requirements of 10CFR50.60, "Acceptance Criteria for Fracture Prevention for LWR Nuclear Power Reactors for Normal Operation," Using Safety Margins Recommended in ASME Code Case N-514 - Palisades Nuclear Plant*, dated March 3, 1995.

CASE
N-514

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: February 12, 1992

See Numerical Index for expiration and any reaffirmation dates.

Case N-514
Low Temperature Overpressure Protection
Section XI, Division 1

Inquiry: Section XI, Division 1, IWB-3730, requires that during reactor operation, load and temperature conditions be maintained to provide protection against failure due to the presence of postulated flaws in the ferritic portions of the reactor coolant pressure boundary. For those plants having low temperature overpressure protection (LTOP) systems, what load and temperature conditions under IWB-3730 may be used to provide protection against failure during reactor start-up and shutdown operation due to low temperature overpressure events that have been classified as Service Level A or B events?

Reply: It is the opinion of the Committee that for those plants having LTOP systems the following load and temperature conditions may be used to provide protection against failure during reactor start-up and shutdown operation due to low temperature overpressure events that have been classified as Service Level A or B events. LTOP systems shall be effective at coolant temperatures less than 200°F or at coolant temperatures[1] corresponding to a reactor vessel metal temperature[2] less than RT_{NDT} + 50°F, whichever is greater. LTOP systems shall limit the maximum pressure in the vessel to 110% of the pressure determined to satisfy Appendix G, para. G-2215 of Section XI, Division 1.

---

[1] The coolant temperature is the reactor coolant inlet temperature.

[2] The vessel metal temperature is the temperature at a distance one-fourth of the vessel section thickness from the inside surface in the vessel beltline region. 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, Rev. 2.