UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Rochester Gas and Electric Corporation	)	Docket No. 50-244
(R. E. Ginna Nuclear Power Plant,	)	
Unit No. 1)	)	

APPLICATION FOR AMENDMENT
TO OPERATING LICENSE

Pursuant to Section 50.90 of the regulations of the U.S. Nuclear Regulatory Commission (the "Commission"), Rochester Gas and Electric Corporation ("RG&E"), holder of Provisional Operating License No. DPR-18, hereby requests that the Technical Specifications set forth in Appendix A to that license be amended to include reactor overpressure protection system requirements.

The proposed technical specification change is set forth in Attachment A to this Application. A safety evaluation is set forth in Attachment B. This evaluation also demonstrates that the proposed change does not involve a significant change in the types or a significant increase in the amounts of effluents or any change in the authorized power level of the facility. Justification for classification of the amendment pursuant to 10 C.F.R. Section 170.22 is included as Attachment C. A check for the appropriate fee accompanies this Application.

WHEREFORE, Applicant respectfully requests that Appendix A to Provisional Operating License No. DPR-18 be amended in the form attached hereto as Attachment A.

Rochester Gas and Electric Corporation

By L.D. White, Jr.

L.D. White, Jr.
Vice President,
Electric and Steam Production

Subscribed and sworn to before me
on this 11th day of October, 1978.

Gary L. Reiss

GARY L. REISS
NOTARY PUBLIC, State of N. Y. Monroe Co.
My Commission Expires March 30, 19 79

Figure 3.10-2 is not met, the plant shall be taken to the hot shutdown condition and the one loop shutdown margin shall be met.

d. At least one reactor coolant pump shall be in operation for a planned transition from one Reactor Operating Mode to another involving an increase in the boron concentration of the reactor coolant.

e. A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures < 330°F unless 1) the pressurizer water volume is less than 324 cubic feet (38% level) or 2) the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

3.1.1.2 Steam Generator

a. One steam generator shall be capable of performing its heat transfer function whenever the average coolant temperature is above 350°F.

b. The temperature difference across the tube sheet shall not exceed 100°F.

3.1.1.3 Safety Valves

a. At least one pressurizer code safety valve shall be operable whenever the reactor head is on the vessel.

b. Both pressurizer code safety valves shall be operable whenever the reactor is critical.

Basis:

When the boron concentration of the reactor coolant system is to be reduced the process must be uniform to prevent sudden reactivity changes in the reactor. Mixing of the reactor coolant will be sufficient

Each of the pressurizer code safety valves is designed to relieve 288,000 lbs. per hr. of saturated steam at the valve set point. Below 350°F and 350 psig in the reactor coolant system, the residual heat removal system can remove decay heat and thereby control system temperature and pressure. If no residual heat were removed by any of the means available the amount of steam which could be generated at safety valve relief pressure would be less than half the valves' capacity. One valve therefore provides adequate defense against overpressurization.

Prohibiting reactor coolant pump starts without a large void in the pressurizer or without a limited RCS temperature differential will prevent RCS overpressurization due to expansion of cooler RCS water as it enters a warmer steam generator. A 38% level in the pressurizer will accommodate the swell resulting from a reactor coolant pump start with a RCS temperature of 140°F and steam generator secondary side temperature of 340°F, or the maximum temperature which usually exists prior to cooling the reactor with the RHR system.

The specification permits an orderly reduction in power if a reactor coolant pump is lost during operation between 130 MWT and 50% of rated power.(2) Above 50% power, an automatic reactor trip will occur if either pump is lost. The power-to-flow ratio will be maintained equal to or less than one which ensures that the minimum DNB ratio increases at lower flow since the maximum enthalpy rise does not increase.

Temperature requirements for the steam generator correspond with measured NDT for the shell and allowable thermal stresses in the tube sheet.

References

(1) FSAR Section 14.1.6

(2) FSAR Section 7.2.3

c. One boric acid tank may be out of service provided a minimum of 2,000 gallons of a 12% to 13% by weight boric acid solution at a temperature of at least 145°F is contained in the operable tank and provided that the tank is restored to operable status within 24 hours.

d. One channel of heat tracing may be out of service provided it is restored to operable status within 24 hours.

3.2.4 Whenever the reactor coolant system is $\geq$ 200°F and is being cooled by the RHR system and the overpressure protection system is not operable, at least one charging pump shall be demonstrated inoperable at least once per 12 hours by verifying that the control switch is in the pull-stop position.

Basis:

The chemical and volume control system provides control of the reactor coolant system boron inventory.(1) This is normally accomplished by using either one of the three charging pumps in series with one of the two boric acid pumps. An alternate method of boration will be to use the charging pumps directly from the refueling water storage tank. A third method will be to depressurize and use the safety injection pumps. There are two sources of borated water available for injection through three different paths.

(1) The boric acid transfer pumps can deliver the boric acid tank contents (12% concentration of boric acid) to the charging pumps.

(2) The charging pumps can take suction from the refueling water storage tank. (2,000 ppm boron solution)

(3) The safety injection pumps can take their suctions from either the boric acid tanks or the refueling water storage tank.

The quantity of boric acid in storage from either the boric acid tanks or the refueling water storage tank is sufficient to borate the reactor coolant in order to reach cold shutdown at any time during core life. Approximately 1800 gallons of the 12% to 13% solution of boric acid are required to meet cold shutdown conditions.(2) Thus, a minimum of 2000 gallons in the boric acid tanks is specified. An upper concentration limit of 13% boric acid in the tank is specified to maintain solution solubility at the specified low temperature limit of 145°F. Two channels of heat tracing are installed on lines normally containing concentrated boric acid solution to maintain the specified low temperature limit.

Placing a charging pump in pull-stop whenever the reactor coolant system temperature is $\geq$ 200°F and is being cooled by RHR without the overpressure protection system operable will prevent inadvertant overpressurization of the RHR system should letdown be terminated.(3)

References:

(1) FSAR, Section 9.2

(2) FSAR, Page 9.2-37

(3) L. D. White, Jr. letter to A. Schwencer, NRC, dated February 24, 1977

(ii) The two reactor coolant drain tank pumps shall be tested and their operability demonstrated prior to initiating repairs of the inoperable residual heat removal pump.

d. One residual heat exchanger may be out of service for a period of no more than 24 hours.

e. Any valve required for the functioning of the safety injection or residual heat removal systems may be inoperable provided repairs are completed within 12 hours. Prior to initiating repairs, all valves in the systems that provide the duplicate function shall be tested to demonstrate operability.

f. Power may be restored to any valve referenced in 3.3.1.1 g for the purposes of valve testing providing no more than one such valve has power restored and provided testing is completed and power removed within 12 hours.

3.3.1.3 Except during diesel generator load and safeguard sequence testing or when the vessel head is removed or the steam generator manway is open a maximum of one safety injection pump shall be operable whenever the temperature of one or more of the RCS cold legs is $\leq$ 330°F.

3.3.1.3.1 Whenever a maximum of one safety injection pump may be operable by 3.3.1.3 at least two of the safety injection pumps shall be demonstrated inoperable at least once per twelve hours by verifying that the control switches are in the pull-stop position.

3.3.2 Containment Cooling and Iodine Removal

3.3.2.1 The reactor shall not be made critical except for low temperature physics tests, unless the following conditions are met:

a. The spray additive tank contains not less than 4500 gallons of solution with a sodium hydroxide concentration of not less than 30% by weight.

b. At least two containment spray pumps are operable.

c. At least three fan cooler units are operable.

until repairs were effected. (16)(17)

The facility has four service water pumps. Only one is needed during the injection phase, and two are required during the recirculation phase of a postulated loss-of-coolant accident. (8) The limits for the accumulator pressure and volume assure the required amount of water injection during an accident, and are based on values used for the accident analyses. The indicated level of 50% corresponds to 1108 cubic feet of water in the accumulator and the indicated level of 82% corresponds to 1134 cubic feet. The limitation for a maximum of one safety injection pump to be operable and the surveillance requirement to verify that two safety injection pumps are inoperable below 330°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

3.15 Overpressure Protection System

Applicability

Applies whenever the temperature of one or more of the RCS cold legs is $\leq$ 330°F.

Objective

To prevent overpressurization of the reactor coolant system.

Specification

3.15.1 At least one of the following overpressure protection systems shall be operable:

a. Two pressurizer power operated relief valves (PORVs) with a lift setting of $\leq$ 435 psig, or

b. A reactor coolant system vent of $\geq$ 1.1 square inches.

3.15.1.1 With one PORV inoperable, either restore the inoperable PORV to operable status within 7 days or depressurize and vent the RCS through a 1.1 square inch vent(s) within the next 8 hours; maintain the RCS in a vented condition until both PORVs have been restored to operable status.

3.15.1.2 With both PORVs inoperable, depressurize and vent the RCS through a 1.1 square inch vent(s) within 8 hours; maintain the RCS in a vented condition until both PORVs have been restored to operable status.

3.15.1.3 Use of the overpressure protection system to mitigate a RCS pressure transient shall be reported in accordance with 6.9.3.

Basis

The operability of two pressurizer PORVs or an RCS vent opening of greater than 1.1 square inches ensures that the RCS will be protected from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are $\leq$ 330°F. Either PORV has adequate relieving capability to protect the RCS from overpressurization when the transient is limited to either (1) the start of an idle RCP with the secondary water temperature of the steam generator $\leq$ 50°F above the RCS cold leg temperature or (2) the start of a safety injection pump and its injection into a water solid RCS.[1]

References:

(1) L. D. White, Jr. letter to A. Schwencer, NRC, dated July 29, 1977

4.16 Overpressure Protection System

Applicability:

Applies to the reactor coolant system overpressure protection system.

Objective:

To verify that the overpressure protection system will function properly if needed.

Specification

4.16.1 Each PORV shall be demonstrated operable by:

a. Performance of a channel functional test on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required operable and at least once per 31 days thereafter when the PORV is required operable.

b. Performance of a channel calibration on the PORV actuation channel at least once per 18 months.

c. Verifying the PORV isolation valve is open at least once per 72 hours when the overpressure protection system is required to be operable.

4.16.2 The RCS vent(s) shall be verified to be open at least once per 12 hours when the vent(s) is being used for overpressure protection except when the vent pathway is provided with a valve which is locked, sealed, or otherwise secured in the open position. Then verify these valves open at least once per 31 days.

(2) Annually: A tabulation on an annual basis of the number of station, utility and other personnel (including contractors) receiving exposures greater than 200 mrem/yr and their associated man rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignment to various duty functions may be estimates based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources shall be assigned to specific major work functions.

(NOTE: This tabulation supplements the requirements of Section 20.407 of 10 CFR Part 20.)

d. Reactor Overpressure Protection System Operation

In the event either the PORVs or the RCS vent(s) are used to mitigate a RCS pressure transient, a Special Report shall be prepared and submitted to the Commission within 30 days. The report shall describe the circumstances initiating the transient, the effect of the PORVs or vent(s) on the transient and any other corrective action necessary to prevent recurrence.

Attachment B

A reactor coolant system overpressure protection system has been installed at R. E. Ginna to mitigate pressure transients that might otherwise exceed those limits which are based upon Appendix G to 10 CFR Part 50. The system is designed to mitigate transients which may result from personnel error, equipment malfunction or procedural deficiencies. A description of this system was provided in letters from Mr. L. D. White, Jr., Rochester Gas and Electric Corporation, to Mr. A. Schwencer, U. S. Nuclear Regulatory Commission, dated February 24, 1977, March 31, 1977, and July 29, 1977. The overpressure protection system will prevent a water solid reactor coolant system from exceeding a pressure of 535 psig for a safety injection pump discharging to the reactor coolant system, a reactor coolant pump start with a 50°F temperature differential between the primary and secondary system or less severe mass input or heat input transients.

The specification prohibiting reactor coolant pump starts unless the filled pressurizer volume is less than 324 ft^3 (38% level) or unless the temperature differential between the primary and secondary systems is less than 50°F will properly limit heat input transients. A pressurizer level of 38% will accommodate the swell resulting from a reactor coolant pump start with a reactor temperature of 140°F and steam generator temperature of 340°F without the need for operation of the overpressure protection system. Relief from the pressurizer power operated relief valves (PORVs) would, however, increase the margin between the peak transient pressure and the limit of Technical Specification 3.1.2. With no gas or steam bubble in the pressurizer the overpressure protection system will by itself prevent the pressure from exceeding Technical Specification 3.1.2.(1)

The specification to limit the number of charging pumps which may be operable when the reactor coolant system temperature is greater than 200°F and the overpressure protection system is inoperable will prevent a potential overpressurization of the residual heat removal system (RHR) should letdown be isolated. Analysis has shown that the RHR system can relieve the input from three charging pumps when the reactor coolant system temperature is less than 200°F and can relieve the input of two charging pumps at temperatures greater than or equal to 200°F.(2) The combined capacity of 3 charging pumps is less than that of one safety injection pump and will not produce transient pressures greater than those which can be mitigated by the overpressure protection system when that system is operable.

Proposed specification 3.3.1.3 will prohibit more than one safety injection pump from being operable when one or more of the RCS cold leg temperatures is less than or equal to 330°F except during diesel generator load and safeguard sequence testing or when the vessel head is removed or the steam generator manway is open. The shutoff head of the safety injection pumps is less than 1500 psig, a pressure well below the allowable pressure for

RCS temperatures of 330°F and above. All safety injection pumps may be operable for temperatures above 330°F; one pump may be operable below 330°F, when the potential for overpressure transients exists, because of the mitigating effect of the overpressure protection system.(1) When the reactor head is removed or when a steam generator manway is open a potential for overpressurization does not exist and there is no restriction on safety injection pump operation. During diesel generator load and safeguard sequence testing extra precautions are taken to prevent safety injection pump discharge to the reactor coolant system. The pump discharge valves are closed, the valve breakers are opened and the DC control fuses are removed. These precautions reduce the potential for overpressurization to an acceptable level during the test period. Surveillance of the pump controls once per twelve hours when only one pump may be operable is appropriate to prevent inadvertent pump starts.

Proposed specification 3.15 requires that an overpressure protection system be operable when one or more of the RCS cold leg temperatures is less than or equal to 330°F. For temperatures greater than 330°F the allowable RCS pressure is greater than the normal relief pressure of the two pressurizer power operated relief valves so that no other overpressure protection is required. Below 330°F each of the PORVs, using a low pressure setpoint of 435 psig, will mitigate pressure transients in a water-solid RCS resulting from the discharge of a single safety injection pump or the starting of a reactor coolant pump with a 50°F temperature differential between the reactor and steam generators.(1) A 1.1 square inch vent is the orifice area equivalent to that of a single PORV.

Because each of the PORVs will provide overpressure protection, 7 days is an acceptable time during which one of the PORVs may be inoperable. After seven days, or in the event that both PORVs are inoperable, 8 hours is an acceptable period of time to establish a RCS vent and is a relatively short period of time to be without additional overpressure protection.

Proposed specification 4.16 requires appropriate action to assure that the overpressure protection system functions properly. A channel functional test will be performed prior to the time that the system is required to be operable and at least once every 31 days thereafter when it is operable. A channel calibration will be performed at least once every 18 months. These tests and calibrations are similar in nature and frequency to those which are performed on plant protection systems even though this system does not perform what is considered to be a safety function.

Verification that the PORV isolation valve is open at least once every 72 hours when the overpressure protection system is required to be operable will provide appropriate assurance that the overpressure protection function has not been inadvertently defeated.

(1) Letter from L. D. White, Jr., Rochester Gas & Electric Corporation, to A. Schwencer, Nuclear Regulatory Commission, July 29, 1977.

(2) Letter from L. D. White, Jr., Rochester Gas & Electric Corporation, to A. Schwencer, Nuclear Regulatory Commission, February 24, 1977

Attachment C

The proposed Amendment to the Provisional Operating License has been evaluated and determined to fall within the definition of Class III of 10 C.F.R. Section 170.22 thereby requiring a fee of $4,000.

The proposed amendment deals with a single safety issue, over-pressure protection of the reactor vessel. The issue has been clearly identified by an NRC position.