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O. W. DIXON, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

October 21, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
Cold Overpressure Protection
System (COPS)

Dear Mr. Denton:

South Carolina Electric and Gas Company (SCE&G), in letters dated June 29, 1983 and August 24, 1983 (Mr. O. W. Dixon to Mr. H. R. Denton), provided a preliminary design of a Cold Overpressure Protection System (COPS) utilizing the Residual Heat Removal System (RHRS) relief valves for Staff review. In conversations with our NRC Project Manager, the review of SCE&G's proposed COPS is to proceed toward the issuance of a Safety Evaluation Report (SER) in March, 1984.

The design and engineering verification of the COPS utilizing the RHRS relief valves has been completed. A proposed Technical Specification change and a Significant Hazards Consideration review are attached.

In our letter of August 24, 1983, SCE&G discussed in general terms the use of power lockouts, augmented by administrative procedures, to mitigate the consequences of a single failure of a pressure transmitter which provides a signal for the automatic closure interlock of RHRS suction isolation valves.

Prior to installation of power lockouts in the control room, the breakers that supply power to the motor operators of the RHRS suction isolation valves will be locked out locally. After the addition of power lockouts in the control room, which is scheduled prior to startup after first refueling, power will be removed from the breakers from the control board. Associated operating procedures will be implemented upon receipt of Staff approval.

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On September 13, 1983, SCE&G, in LER No. 83-100, notified Region II of a single failure concern involving our present COPS which utilizes Pressurizer Power Operated Relief Valves (PORVs). The present design of the control circuitry for the COPS utilizing the PORVs is subject to a scenerio where a loss of electrical power to the Channel IV Protection Cabinet will inadvertently open PORV PCV-445A. Following the discovery of this single failure, SCE&G contacted Westinghouse requesting that a safety evaluation be performed to determine the safety significance of an inadvertent opening of a PORV. Westinghouse's preliminary safety evaluation indicated that even though a loss of coolant accident (LOCA) due to inadvertent opening of a PORV has a higher probability of occurring, the Virgil C. Summer Nuclear Station safeguards equipment is adequate to mitigate the consequences of the inadvertent opening of a PORV. Furthermore, Westinghouse stated that the inadvertent opening of a single PORV coincident with an initiating failure of a another PORV is bounded by the spectrum of FSAR small break LOCA analyses.

Although the plant's safeguards equipment is adequate to mitigate the consequences of an inadvertent opening of a PORV, SCE&G considers operation with the PORV's block valve closed undesirable because of the reduced relief capacity. With PORV PCV-445A blocked and an additional PORV blocked due to leakage past the valve, the probability of lifting a Pressurizer Safety Valve is increased.

Therefore, SCE&G requests that the Staff expedite the review of the RHRS relief valves as the primary method of mitigating cold overpressurization transients. SCE&G feels this solution not only resolves the undesirability of operating with the PORV blocked, but also eliminates the necessity of performing hardware modifications to the PORV circuitry. The PORV will no longer be required to perform in a cold overpressurization mitigation capacity once the RHRS relief valves are approved as the method of mitigating cold overpressurization transients. As stated previously, SCE&G understands that the completion of the review of this item is planned for March, 1984. Please provide a revised schedule for issuance of your SER on this issue.

The attached Technical Specification change has been reviewed and approved by both the Plant Safety Review Committee and the Nuclear Safety Review Committee. A check in the amount of Four Thousand Dollars ($4,000.00) is provided to process the Technical Specification change.

Should you have any questions or comments, please advise.

Very truly yours,

O. W. Dixon, Jr.

WRM:OWD/fjc
Attachment:
cc: V. C. Summer
E. C. Roberts
E. H. Crews, Jr.
T. C. Nichols, Jr./O. W. Dixon, Jr.
H. N. Cyrus
J. P. O'Reilly
Group Managers
O. S. Bradham
R. B. Clary
C. A. Price
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C. L. Ligon (NSRC)
G. J. Braddick
D. J. Richards
NRC Resident Inspector
J. B. Knotts, Jr.
NPCF
File

LIMITING CONDITIONS FOR OPERATION

3.4.9.3 At least one of the following overpressure protection systems shall be OPERABLE:

a. Two RHR relief valves with:

1. A lift setting of less than or equal to 450 psig, and

2. The associated RHR relief valve isolation valves open; or

b. The Reactor Coolant System (RCS) depressurized with a RCS vent of greater than or equal to 2.7 square inches.

APPLICABILITY:

MODE 4 when the temperature of any RCS cold leg is less than or equal to 300°F, Mode 5, and Mode 6 with the reactor vessel he[illegible].

ACTION:

a. With one RHR relief valve inoperable, restore the inoperable valve to OPERABLE status within 7 days or depressurize and vent the RCS through a greater than or equal to 2.7 square inch vent within the next 8 hours.

b. With both RHR relief valves inoperable, within 8 hours either:

1. Restore at least one RHR relief valve to OPERABLE status, or

2. Depressurize and vent the RCS through a greater than or equal to 2.7 square inch vent.

c. In the event an RHR relief valve or RCS vent is used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the RHR relief valves or vent on the transient and any corrective action necessary to prevent recurrence.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Each RHR relief valve shall be demonstrated OPERABLE by:

a. Verifying the RHR relief valve isolation valves (8701A, 8701B, 8702A and 8702B) are open at least once per 72 hours when the RHR relief valve is being used for overpressure protection.

b. Testing pursuant to Specification 4.0.5.

c. Verification of the RHR relief valve setpoint of at least one RHR relief valve, at least once per 18 months on a rotating basis.

4.4.9.3.2 The RCS vent shall be verified to be open at least once per 12 hours* when the vent 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, verify these valves open at least once per 31 days.

PRESSURE/TEMPERATURE LIMITS (Continued)

The second portion of the heatup analysis concerns the calculation of pressure-temperature limitations for the case in which a 1/4T deep outside surface flaw is assumed. Unlike the situation at the vessel inside surface, the thermal gradients established at the outside surface during heatup produce stresses which are tensile in nature and thus tend to reinforce any pressure stresses present. These thermal stresses, of course, are dependent on both the rate of heatup and the time (or coolant temperature) along the heatup ramp. Furthermore, since the thermal stresses, at the outside are tensile and increase with increasing heatup rate, a lower bound curve cannot be defined. Rather, each heatup rate of interest must be analyzed on an individual basis.

Following the generation of pressure-temperature curves for both the steady-state and finite heatup rate situations, the final limit curves are produced as follows. A composite curve is constructed based on a point-by-point comparison of the steady-state and finite heatup rate data. At any given temperature, the allowable pressure is taken to be the lesser of the three values taken from the curves under consideration.

The use of the composite curve is necessary to set conservative heatup limitations because it is possible for conditions to exist such that over the course of the heatup ramp the controlling condition switches from the inside to the outside and the pressure limit must at all times be based on analysis of the most critical criterion.

Finally, the composite curves for the heatup rate data and the cooldown rate data are adjusted for possible errors in the pressure and temperature sensing instruments by the values indicated on the respective curves.

Although the pressurizer operates in temperature ranges above those for which there is reason for concern of non-ductile failure, operating limits are provided to assure compatibility of operation with the fatigue analysis performed in accordance with the ASME Code requirements.

The OPERABILITY of two ~~PORVs~~ RHRSRVs or an RCS vent opening of at least 2.7 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 less than or equal to 300°F. Either ~~PORV~~ RHRSRV 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 less than or equal to 50°F above the RCS cold leg temperatures or (2) the start of a HPSI pump and its injection into a water solid RCS.

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.9.3 At least one of the following overpressure protection systems shall be OPERABLE:

a. Two power operated relief valves (PORVs) with a lift setting of less than or equal to the maximum setpoint defined by Figure 3.4-4, or

b. The Reactor Coolant System (RCS) depressurized with an RCS vent of greater than or equal to 2.7 square inches.

APPLICABILITY: MODE 4 when the temperature of any RCS cold leg is less than or equal to 300°F, MODE 5, and MODE 6 with the reactor vessel head on.

ACTION:

a. In the event either PORV becomes inoperable notify the Commission within 7 days. In the event both PORVs are inoperable, notify the Commission within 24 hours. In both cases a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the cause of the inoperability, plans for restoring the valves to OPERABLE status and any corrective action necessary to prevent recurrence.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Each PORV shall be demonstrated OPERABLE by:

a. Performance of an ANALOG CHANNEL OPERATIONAL 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 PORV is being used for overpressure protection.

4.4.9.3.2 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.

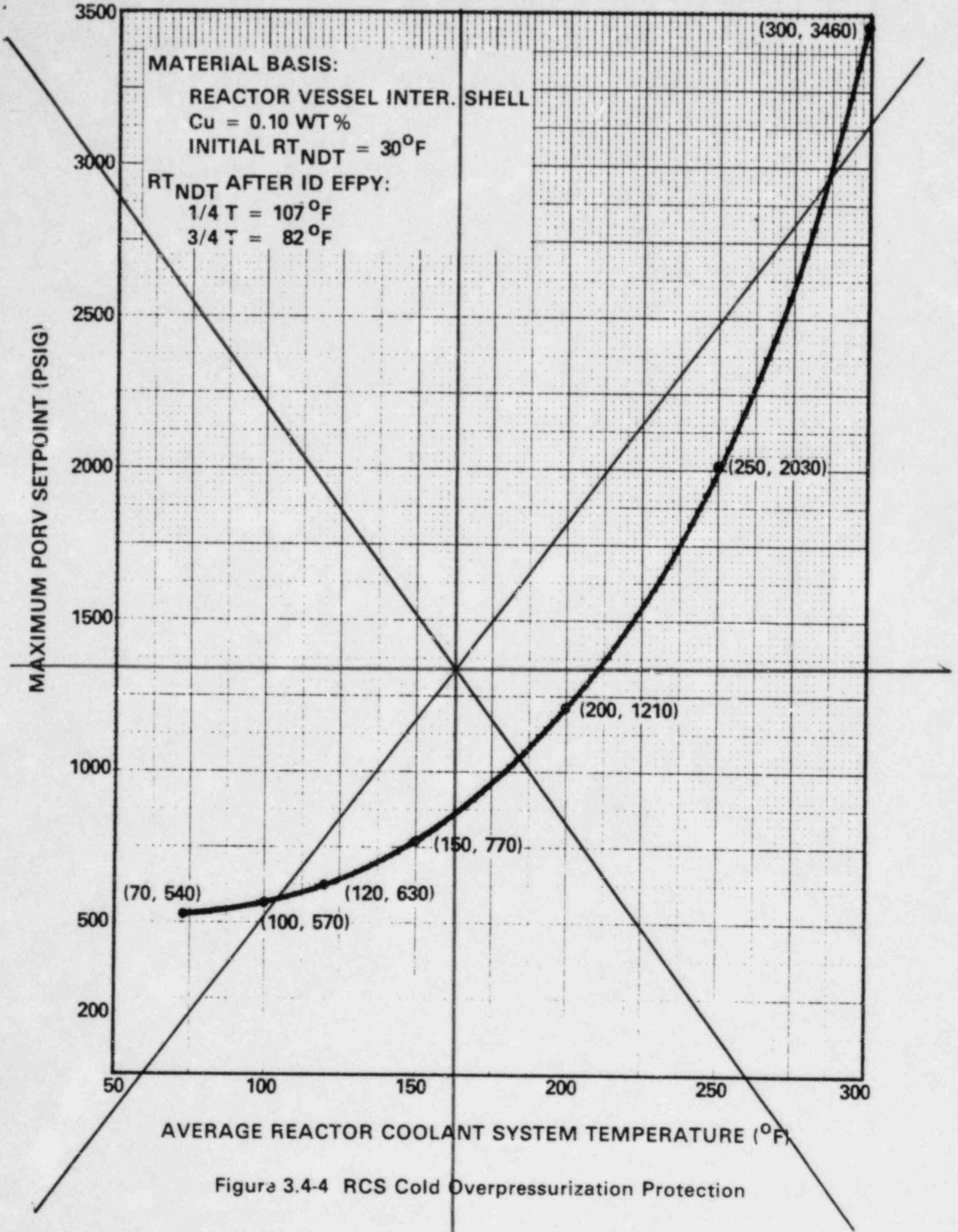

Figura 3.4-4 RCS Cold Overpressurization Protection

10CFR 50.92

SIGNIFICANT HAZARDS CONSIDERATION

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

   ANSWER: No - The amendment to the Technical Specifications implements a Cold Overpressure Protection System (COPS), utilizing the RHRS relief valves, that is capable of mitigating the consequences of the "worst case" mass and heat input transients.

2. Would the proposed amendment create the possibility of a new kind of accident from any accident previously evaluated?

   ANSWER: No - The "worst case" mass and heat input transients evaluated previously have not changed as a result of the amendment to the Technical Specifications implementing the proposed COPS. Additionally, no new accident has been created by the amendment to the Technical Specifications.

3. Would the proposed amendment involve a significant reduction in the margin of safety?

   ANSWER: No - Peak reactor coolant pressure according to transient analyses will remain well below the 10CFR50 Appendix G limits. Additionally, the proposed COPS will maintain reactor pressure well below RHRS design pressure during cooldown with the RHRS operating. There will be no impact on the margin of safety.