New Hampshire
Yankee

Ted C. Feigenbaum
President and
Chief Executive Officer

NYN-91079

May 16, 1991

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

References: (a) Facility Operating License No. NPF-86, Docket No. 50-443

(b) WCAP-11736A, "Residual Heat Removal System Autoclosure Interlock Removal Report for the Westinghouse Owner's Group", Revision 0.0, October 1989

(c) NHY Letter NYN-91011 dated January 24, 1991, "Request for License Amendment - Residual Heat Removal System Isolation Valve Autoclosure Interlock Removal", T.C. Feigenbaum to USNRC

(d) USNRC Letter dated April 16, 1991, "Seabrook Proposal to Remove Residual Heat Removal (RHR) Autoclosure Interlock (TAC No. 79624)", G. E. Edison to T. C. Feigenbaum

Subject: Supplement to Request for License Amendment - Residual Heat Removal System Isolation Valve Autoclosure Interlock Removal

Gentlemen:

New Hampshire Yankee (NHY) has enclosed herein supplemental information to its January 24, 1991, license amendment request regarding the Residual Heat Removal System Isolation Valve Autoclosure Interlock Removal [Reference (c)]. The following supplemental information is enclosed as requested by the USNRC Staff representatives during conference calls with NHY personnel on March 26, March 28 and April 11, 1991 [Reference (d)].

Enclosure 1 - Supplemental Response to NRC Staff Position 5 on WCAP-11736.

Enclosure 2 - Supplemental Response to NRC Staff Position 4 on WCAP-11736.

Enclosure 3 - Supplemental Information and No Significant Hazards Consideration for Proposed Changes to Technical Specification Surveillance Requirement 4.4.9.3.2 (Surveillance Frequency for RHR Suction Isolation Valves).

Enclosure 4 - Supplemental Information and No Significant Hazards Consideration for Proposed Changes to Technical Specification 3.4.9.3 (RHR Suction Relief Valve Setpoint Change).

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Should you require additional information regarding this matter please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521, extension 3772.

Very truly yours,

Ted C. Feigenbaum

TCF:JMP/les

Enclosure

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ENCLOSURE 1 TO NYN-91079

SUPPLEMENTAL RESPONSE TO NRC STAFF POSITION 5 ON WCAP-11736

NRC STAFF POSITION (5)

The RHR suction valve operator should be sized so that the valves cannot be opened against full system pressure.

SUPPLEMENTAL RESPONSE

New Hampshire Yankee (NHY) attempted to confirm that the Residual Heat Removal (RHR) inlet isolation valve motor-operated actuators are incapable of opening the valves when the Reactor Coolant System (RCS) is at full pressure (2235 psig). The valves in question (RC-V22, RC-V23, RC-V87 and RC-V88) are included in our motor operated valve (MOV) Program and are subject to established program controls and the normal MOV operating practices. During MOV operation in the open direction, the actuator torque switch is bypassed until the valve is approximately 30% open. This feature ensures that the valves disc is unseated before engaging the actuator torque switch protective feature. Although these valves are not designed or tested to open against full system pressure, based upon our engineering judgement these valves potentially could open against the RCS pressure of 2235 psig.

However, it can be stated that these valves by design cannot be opened at full RCS pressure due to the existence of the open permissive interlock. This redundant and diverse interlock prevents opening of the RHR inlet isolation valves when the RCS pressure is greater than or equal to 365 psig. In accordance with Technical Specification 4.5.2.d.1, this Open Permissive Interlock is tested on an eighteen month frequency. The RHR Autoclosure Interlock removal modification does not change the open permissive circuitry. Therefore, the open permissive interlock will prevent the valves from being opened with the RCS at pressure and, accordingly, sizing of the valve motor operators to preclude opening against full system pressure is not a design criteria for these valves. In addition to the open permissive interlock, administrative controls ensure that these valves are not inadvertently opened at full RCS pressure. These administrative controls include procedural requirements to close and remove power from the RHR suction isolation valves during startup prior to entering Mode 3.

The Seabrook Station RHR inlet isolation valves are located inside the containment and are Safety Class 1. The code class break occurs after the second isolation valve and prior to the RHR suction relief valve which is also located inside the containment. The Seabrook design is very similar to that of the Callaway plant. Simplified diagrams showing the Seabrook and Callaway configurations are provided as Figures 1 and 2 respectively.

In order for an interfacing system LOCA to potentially occur the operators would have to fail to remove power from the valves, contrary to procedures, while concurrently the open permissive interlock fails and inadvertent open signals are applied to the valves causing them to open against full RCS pressure.

It is noted that the interfacing systems LOCA analysis included in WCAP-11736 (see Section 7.3) does not take credit for the inability of the motor operators to open the RHR suction isolation valves in Modes 1, 2, or 3. Rather it was mentioned as a note of conservatism. The conclusions of WCAP-11736 relative to interfacing systems LOCA frequencies is not affected by RHR suction isolation valve actuator sizing and its ability or inability to open valves at normal RCS operating pressures.

FIGURE 1

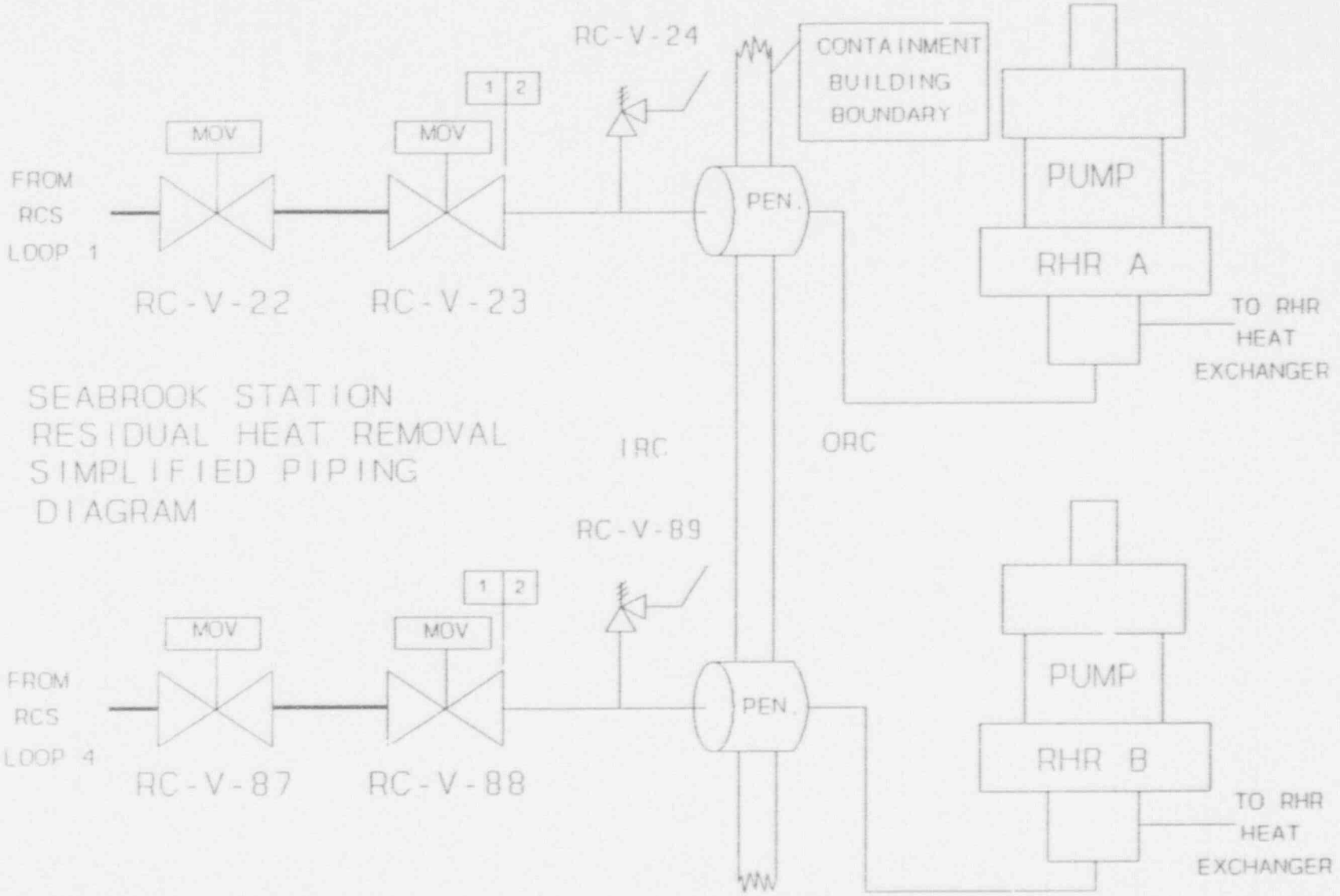
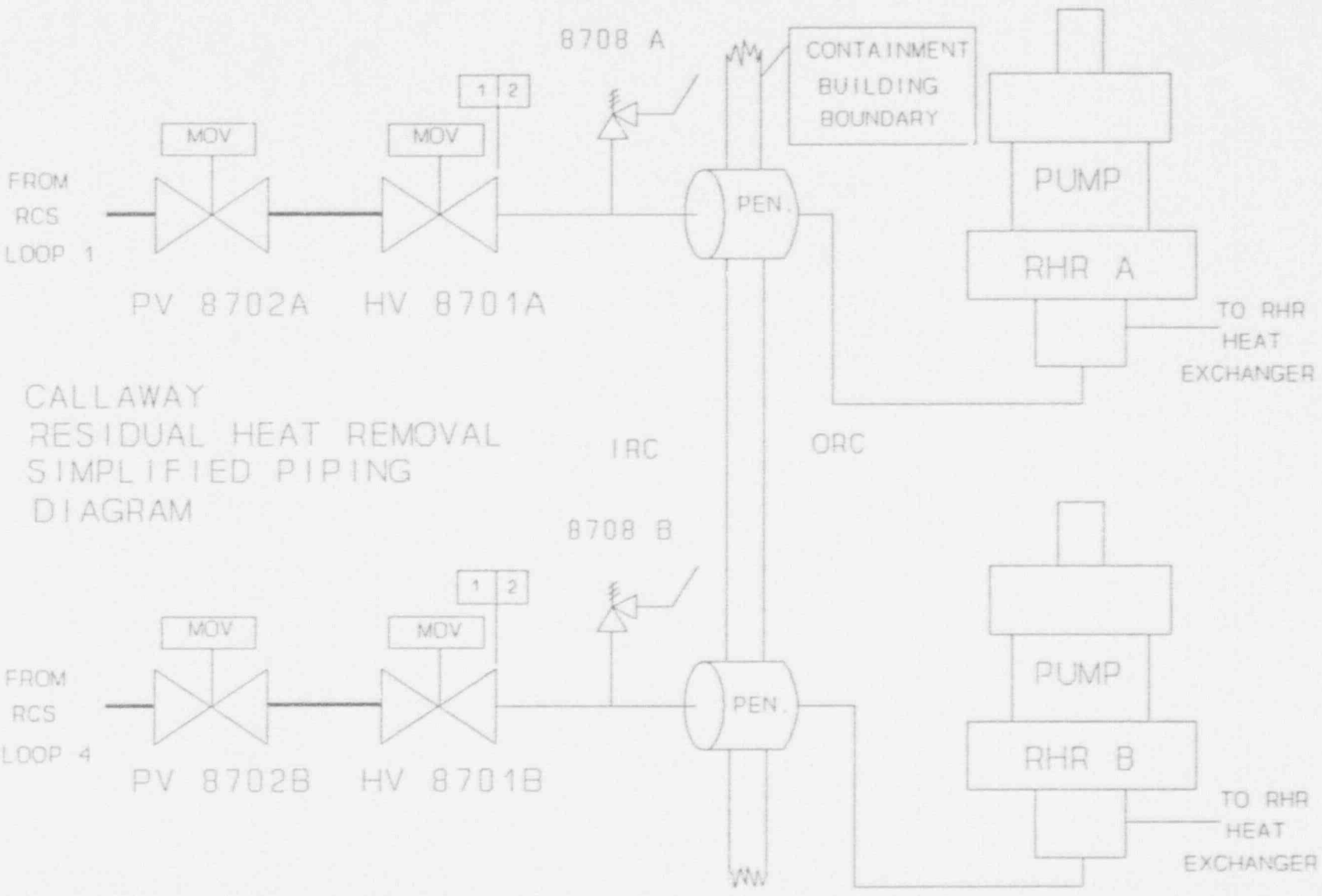

RC-V-24
CONTAINMENT
BUILDING
BOUNDARY
1
2
MOV
MOV
FROM
RCS
LOOP 1
PEN.
PUMP
RHR A
TO RHR
HEAT
EXCHANGER
RC-V-22
RC-V-23
SEABROOK STATION
RESIDUAL HEAT REMOVAL
SIMPLIFIED PIPING
DIAGRAM
IRC
ORC
RC-V-89
1
2
MOV
MOV
FROM
RCS
LOOP 4
PEN.
PUMP
RHR B
TO RHR
HEAT
EXCHANGER
RC-V-87
RC-V-88

FIGURE 2


8708 A
CONTAINMENT
BUILDING
BOUNDARY
1
2
MOV
MOV
FROM
RCS
LOOP 1
PEN.
PUMP
RHR A
TO RHR
HEAT
EXCHANGER
PV 8702A
HV 8701A
CALLAWAY
RESIDUAL HEAT REMOVAL
SIMPLIFIED PIPING
DIAGRAM
IRC
ORC
8708 B
1
2
MOV
MOV
FROM
RCS
LOOP 4
PEN.
PUMP
RHR B
TO RHR
HEAT
EXCHANGER
PV 8702B
HV 8701B

New Hampshire Yankee
May 16, 1991

ENCLOSURE 2 TO NYN-91079

SUPPLEMENTAL RESPONSE TO NRC STAFF POSITION 4 ON WCAP-11736

NRC STAFF POSITION (4)

"Where feasible, power should be removed from the RHR suction valves prior to their being leak-checked [plant specific]."

SUPPLEMENTAL RESPONSE

New Hampshire Yankee (NHY) does not believe that removing power from the RHR suction valves prior to their being leak tested is beneficial to plant safety or plant operation as discussed below.

Operating procedures require that the RHR suction valves be closed and power be removed prior to entry into Mode 3. NHY does not remove power from the RHR suction valves prior to their being leak tested because the leak testing is normally performed in Mode 4, 5 or 6 and the tested RHR trains are returned to service [see (1), below]. Leak testing the RHR suction valves prior to final RHR suction valve closure in the heatup sequence is consistent with Seabrook Station Technical Specifications which exempt the RHR suction valves from leak testing after each valve actuation [see (2), below]. The RHR suction valves are closed and power is removed prior to entering Mode 3 (e.g. exceeding 350°F) [see (3), below]. Adequate assurances that the RHR suction valves are closed with power removed, to preclude RHR overpressurization, is provided by control room valve-open alarms and by the heatup sequence procedural requirements to close and remove power from the valves prior to entering Mode 3. Valve closure is verified by reliable position indication in the control room [see (4), below]. Valve operator power removal is also indicated in the control room.

As discussed below, NHY's procedures for performing the RHR suction valve leak test provides operational flexibility, in that leak testing may be performed prior to final RHR suction valve closure in the heatup sequence. After leak testing one train of RHR suction valves (RC-V22 and RC-V23 or RC-V87 and RC-V88) the tested RHR train is returned to service while the other train is being tested. There is no safety benefit associated with removal of power from the valves being tested. This requirement would add procedural complexity and time associated with removing and restoring power supplies. The additional testing time is undesirable in that it is potentially decreases the availability of decay heat removal loops and decreases the availability of the RHR suction relief valves to assist the Cold Overpressure Mitigation System in mitigating a RCS pressure transient.

Leak testing of the RHR suction valves is normally performed prior to final RHR suction valve closure in the heatup sequence. Early performance of the leak test prior to entry into Mode 3 is desirable for the following reasons:

- RCS temperature and pressures are lower, thus minimizing the personnel safety concerns associated with containing the leakage for measurement as required by this test.

- If a valve exhibits unacceptable leakage, the cooldown required to perform valve maintenance is minimized. Technical Specification 3.4.6.2 specifies the maximum allowable leakage from the RHR suction valves to be 5 GPM.

- If the leak test were performed in Mode 3, the time required to perform the test could result in it being the critical path activity for entry into Mode 2. It is

estimated from previous experience that the leak test, EX1804.047 requires 16 hours for both trains.

(1) RHR Suction Valve Leak Testing Procedure

NHY performs leak testing of the RHR suction valves RC-V22, RC-V23, RC-V87 and RC-V88 per procedure EX1804.047 ("Reactor Coolant Pressure Isolation Valve Leak Rate Testing"). EX1804.047 allows testing of the RHR suction valves "in Modes 3 through 6 and after the RHR suction relief valve is no longer needed for LTOP protection". EX1804.047 does not require that power be removed from the RHR suction valve operators prior to the performance of the leak test. Upon completion of leak testing of each train of RHR suction valves, the procedure directs the "return of the valves to the original pretest lineup or per the direction of the Unit Shift Supervisor."

(2) Technical Specification 3/4.4.6.2, RCS Pressure Isolation Valve Leak Testing Requirements

Technical Specification Surveillance Requirement 4.4.6.2.2 requires leak testing of RCS pressure isolation valves. Surveillance Requirement 4.4.6.2.2.d requires that the leak test be performed within 24 hours following valve actuation due to automatic or manual action or flow through the valve, however the RHR suction valves are exempted from this requirement.

(3) RCS Heatup Procedure

NHY's procedure for "Heatup from Cold Shutdown to Hot Standby" (OS1000.01) requires that within 24 hours after entering Mode 3, but before entering Mode 2, the RHR suction valves be leak tested or verified to have been leak tested within the last 9 months. Prior to entering Mode 3, with RCS temperature less than 350°F the RHR system is isolated from the RCS by closing the suction valves in each RHR train and removing power from the valve operators. RHR suction valve closure is verified by control room operators using reliable position indicating lights on the Main Control Board. Valve operator power removal is also indicated in the control room.

(4) RHR Suction Valve Position Indication

The position indication for these valves is provided from the motor operator limit switches. This configuration is considered reliable and repeatable for the following reasons:

The valve operator is stopped by operation of the closing torque switch, not the valve position limit switch,

The valve position limit switches are gear driven, not subject to drifting, and their settings are verified periodically as part of the NHY Motor Operated Valve Diagnostic Test Program,

The valve is closed under no-flow and low RCS pressure conditions that result in low valve operating stresses. Valve mechanism failure that would cause a valve position limit switch to indicate closed without the valve disk being seated is highly unlikely, and

Position indication is verified to be correct for these valves by performance of position indication testing as required by ASME Section XI, Subsection IWV. (not greater than each 24 months)

ENCLOSURE 3 TO NYN-91079

SUPPLEMENTAL INFORMATION AND NO SIGNIFICANT HAZARDS CONSIDERATION FOR PROPOSED CHANGES TO TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 4.4.9.3.2 (SURVEILLANCE FREQUENCY FOR RHR SUCTION ISOLATION VALVES

Currently Technical Specification Surveillance Requirement 4.4.9.3.2 requires the following:

4.4.9.3.2 Each RHR suction relief valve shall be demonstrated OPERABLE when the RHR suction relief valves are being used for cold overpressure protection as follows:

a. For RHR suction relief valve RC-V89

1) By verifying at least once per 31 days that RHR RCS Suction Isolation Valve RC-V88 is open with power to the valve operator removed, and

2) By verifying at least once per 12 hours that RC-V87 is open.

b. For RHR suction relief valve RC-V24

1) By verifying at least once per 31 days that RC-V22 is open with power to the valve operator removed, and

2) By verifying at least once per 12 hours that RC-V23 is open.

c. Testing pursuant to Specification 4.0.5.

The proposed change to TS SR 4.4.9.3.2 requires the following:

4.4.9.3.2 Each RHR suction relief valve shall be demonstrated OPERABLE when the RHR suction relief valves are being used for cold overpressure protection as follows:

a. For RHR suction relief valve RC-V89 by verifying at least once per 72 hours that RHR RCS suction isolation valves RC-V87 and RC-V88 are open.

b. For RHR suction relief valve RC-V24 by verifying at least once per 72 hours that RHR RCS suction isolation valves RC-V22 and RC-V23 are open.

c. Testing pursuant to Specification 4.0.5.

The current TS SR 4.4.9.3.2 requires a verification that power is removed from RC-V88 and RC-V22. The current requirement to verify power is removed ensures that a single failure of the common pressure transmitter PT-403 for RC-V22 and RC-V87 or the common pressure transmitter PT-405 for RC-V23 and RC-V88 does not result in both trains of RHR being isolated from the RCS (see Figure 3).

The proposed TS SR 4.4.9.3.2 does not require the removal of power from any of the RHR suction valves. With the disabling of the RHR Autoclosure Interlock (ACI) circuitry there is no mechanism for autoclosure of the RHR suction isolation valves which can result in both RHR trains being isolated from the RCS (see Figure 4) and concomitant loss of RHR cooling.

The proposed TS SR 4.4.9.3.2 also changes the surveillance frequency for verification that the RHR suction valves are open as follows:

RC-V22	from once per 31 days to once per 72 hours
RC-V23	from once per 12 hours to once per 72 hours
RC-V87	from once per 12 hours to once per 72 hours
RC-V88	from once per 31 days to once per 72 hours

The proposed 72 hour surveillance frequency for verifying that the RHR suction valves are open when the RHR relief valves are being utilized for RCS cold overpressure protection is identical to the surveillance frequency for verifying that the Power Operated Relief Valves (PORV) isolation valves are open when the PORV's are being utilized for RCS cold overpressure protection (see TS SR 4.4.9.3.1). The same 72 hour open verification surveillance frequency and basis was provided for Callaway as stated in WCAP-11736 (see Section 8.2, pages 8-4 and 8-5 attached). The proposed reduction in the surveillance frequency for verifying that RC-V23 and RC-V87 are open (eg. 12 hours to 72 hours), increase in the surveillance frequency for verifying that RC-V22 and RC-V88 are open (eg. 31 days to 72 hours), and eliminating the requirement to verify that power is removed from the motor operators for RC-V22 and RC-V88 do not involve a significant hazards consideration pursuant to 10 CFR 50.92 as discussed below:

1. The proposed change in the surveillance frequencies for verifying that the RHR suction isolation valves RC-V22, RC-V23, RC-V87 and RC-V88 are open and eliminating the requirement to verify that power is removed from the motor operators for RC-V88 and RC-V22 does not involve a significant increase in the probability or consequences of an accident previously evaluated. The purpose of the surveillance requirement is to ensure that the RHR suction isolation valves remain open when the RHR suction relief valves RC-V24 and RC-V89 are being used for RCS cold overpressure protection.

   The current requirements to remove power from RC-V22 and RC-V88 ensures that a single component failure (pressure transmitter) does not result in the isolation of both RHR trains from the RCS. The disabling of the RHR Autoclosure Interlock (ACI) circuitry eliminates the mechanism for autoclosure of the RHR suction isolation valves, thus the requirement to remove power from the valve operators is unnecessary and undesirable because the ability to expeditiously isolate the RHR system from the RCS is precluded in the event of an RHR system LOCA.

   The proposed 72 hour surveillance frequency for verifying that RC-V22, RC-V23, RC-V87 and RCV-88 are open when the RHR suction relief valves are being utilized for RCS cold overpressure protection is identical to the surveillance frequency for verifying that the Power Operated Relief Valves

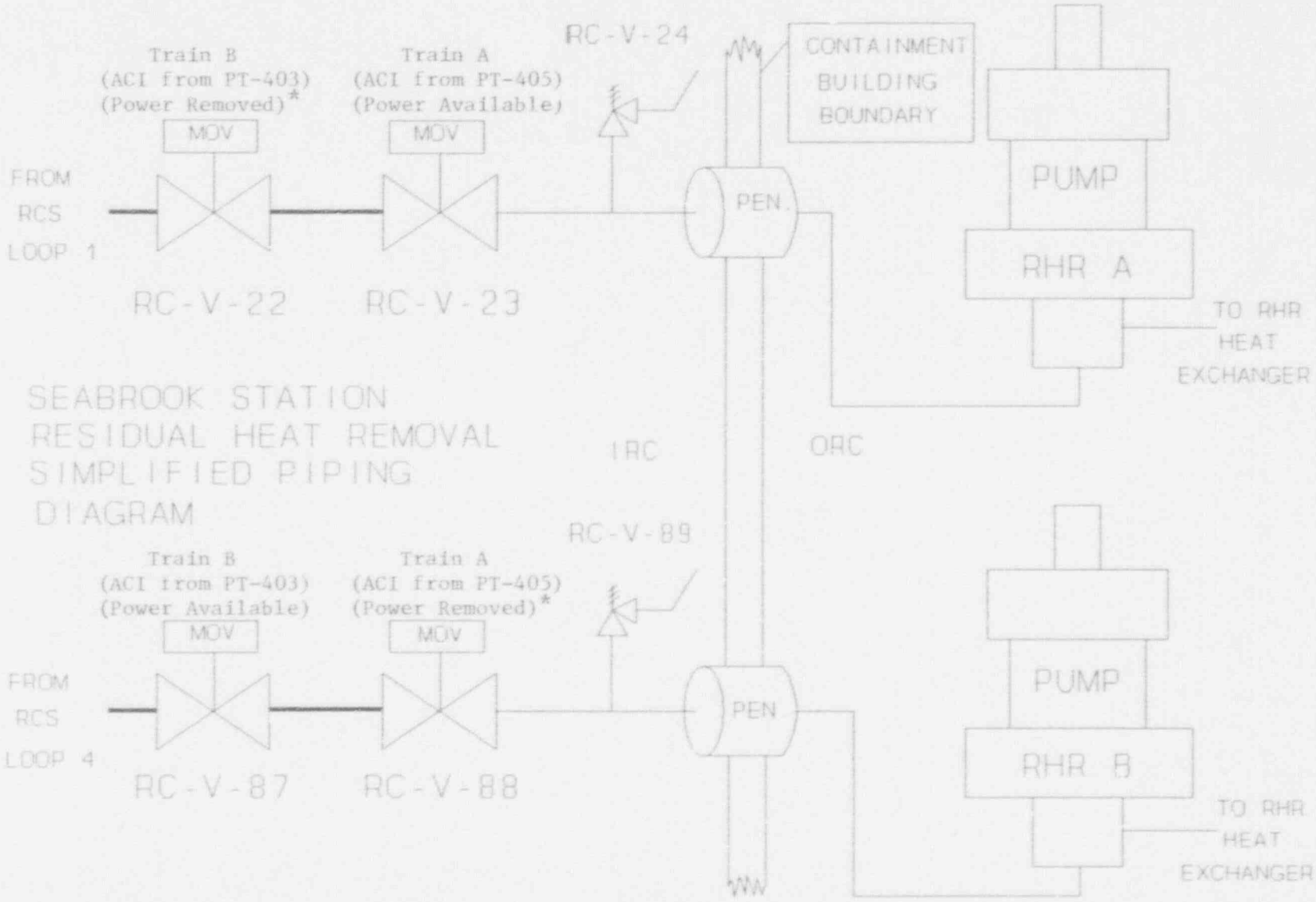
(PORV) isolation valves are open when the PORV's are being utilized for RCS cold overpressure protection. As stated above, the disabling of the RHR ACI circuitry eliminates the mechanism for autoclosure of the RHR suction isolation valves, thus the 12 hour open verification surveillance for RC-V23 and RC-V87 is overly restrictive and inconsistent with the open verification surveillance requirement for the PORV isolation valves. The current 31 day open verification surveillance for RC-V22 and RC-V88 is proposed to be changed to a 72 hour surveillance which is more conservative than the 31 day open verification and consistent with the open verification surveillance requirement for the PORV isolation valves.

2. The proposed change in the surveillance frequencies for verifying that the RHR suction isolation valves RC-V22, RC-V23, RC-V87 and RC-V88 are open and eliminating the requirement to verify that power is removed from the motor operators for RC-V88 and RC-V22 does not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed change in the open verification surveillance frequency and the elimination of the requirement to verify the removal of power from the motor operators does not create a new or different kind of accident because the disabling of the RHR ACI circuitry eliminates the mechanism for autoclosure of the RHR suction isolation valves and concomitant loss of RHR cooling.

3. The proposed change in the surveillance frequency for verifying that the suction isolation valves RC-V22, RC-V23, RC-V87 and RC-V88 are open and eliminating the requirement to verify that power is removed from the motor operators for RC-V88 and RC-V22 does not involve a significant reduction in a margin of safety. The elimination of the requirement to verify that power is removed from the motor operators for RC-V88 and RC-V22 provides an increase in the margin of safety because these isolation valves along with RC-V87 and RC-V23 will have power available allowing their expeditious closure from the control room in the event of a RHR system LOCA. The disabling of the RHR ACI circuitry eliminates the mechanism for autoclosure of these valves and concomitant loss of RHR cooling.

FIGURE 3

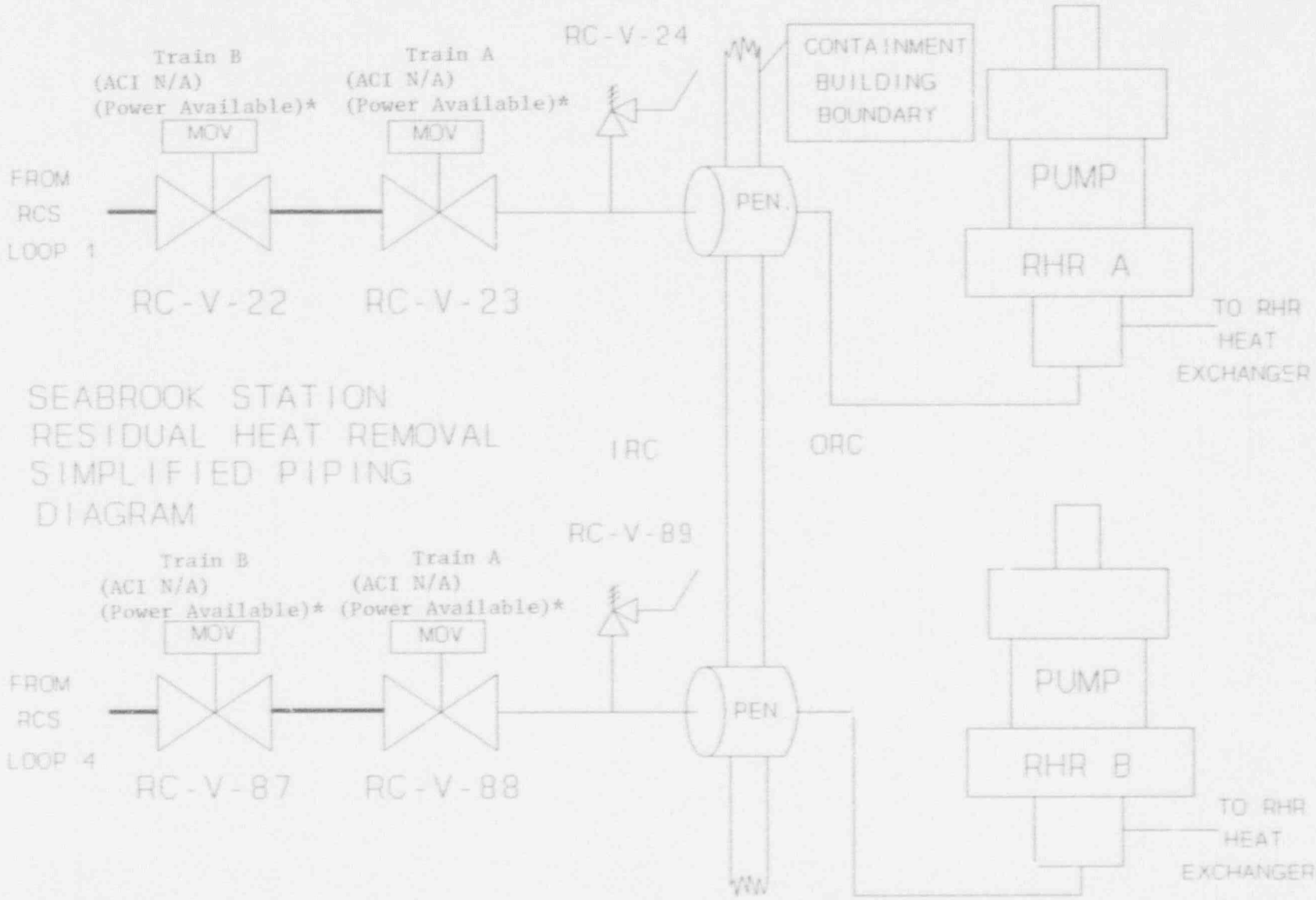
(Before ACI Removal)



*Power is removed from RC-V-22 and RC-V-88 per Technical Specification 4.4.9.3.2 to preclude isolation of both RHR trains in the event that either PT-403 or PT-405 fails and generates a spurious closure signal to both RHR trains.

FIGURE 4

(After ACI Removal)



*Power is available to RC-V-22, RC-V-23, RC-V-87, and RC-V-88. With the disabling of the AC circuitry there is no single failure which can cause both RHR trains to isolate.

8.2 Proposed Revision of Technical Specifications

This section provides the technical specification revisions necessary to implement the removal of the RHRS autoclosure interlock feature at each of the four reference plants.

SALEM

The portion of the 18 month surveillance contained in specification 4.5.2.i associated with verifying that the RHRS suction/isolation valves automatically close on a RCS pressure signal should be deleted as shown in Figure 8-8. With the removal of the autoclosure interlock function, there is no longer a need to retain this surveillance requirement. It should be noted that the RHRS open permissive interlock surveillance requirement remains unchanged.

CALLAWAY

The portion of the 18 month surveillance contained in specification 4.5.2.d.1.b associated with verifying that the RHRS suction/isolation valves automatically close on a RCS pressure signal should be deleted as shown in Figure 8-9. With the removal of the autoclosure interlock function there is no longer a need to retain this surveillance requirement. It should be noted that the RHRS open permissive interlock surveillance requirement remains unchanged.

The 31 day surveillance contained in Specifications 4.4.9.3.2.a.1 and 4.4.9.3.2.b.1, verifying that the RHRS suction/isolation valve is open with power removed to the valve operator, should be deleted as shown in Figure 8-10. With the removal of the autoclosure interlock circuitry on the RHRS suction/isolation valve a failure of a pressure transmitter can not result in the valves stroking closed. Thus the postulated occurance of a single failure isolating both RHRS trains while the RHRS relief valves are providing cold overpressure protection can not occur and the surveillance requirement to open and lock-out power to the valves is redundant.

The RHRS suction/isolation valves which had been in the 31 day surveillance should be added to the 12 hour surveillance which requires the valve to be verified open as shown in Figure 8-10. This is necessary to insure that free communication exists between the RCS and the RHRS when the RHRS relief valves are providing cold overpressure protection to the RCS.

Additionally, the 12 hour surveillance interval of specification 4.4.9.3.2.a.2 and 4.4.9.3.2.b.2 should be changed to be consistent with the surveillance interval of specification 4.4.9.3.1.c for verifying that the PORV isolation valves are open when the PORV is used for overpressure protection. The change is shown in Figure 8-10.

Bases section 3/4.4.9 should be modified to delete the discussion on removing power to the RHRS suction/isolation valves as shown in Figure 8-11.

NORTH ANNA UNIT 1

The 18 month surveillance contained in Specification 4.7.9.1.a associated with verifying that the RHRS suction/isolation valves automatically close on a RCS pressure signal should be deleted as shown in Figure 8-12. With the removal of the autoclosure interlock function, there is no longer a need to retain this surveillance requirement.

SHEARON HARRIS

The portion of the 18 month surveillance contained in specification 4.5.2.d.1 associated with verifying that the RHRS suction/isolation valves automatically close on a RCS pressure signal should be deleted as shown in Figure 8-13. With the removal of the autoclosure interlock function there is no longer a need to retain this surveillance requirement. It should be noted that the RHRS open permissive interlock surveillance requirement remains unchanged.

EMERGENCY CORE COOLING SYSTEMS

REVISION 1

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
BM-HV-8813	Safety Injection to RWST Isolation Vlv	Open
EM-HV-8802A(B)	SI Pump Discharge Hot Leg Iso Vlvs	Closed
EM-HV-8835	Safety Injection Cold Leg Iso Valve	Open
EJ-HV-8840	RHR/SI Hot Leg Recirc Iso Valve	Closed
EJ-HV-8809A	RHR to Accum Inj Loops 1 & 2 Iso Vlv	Open
EJ-HV-8809B	RHR to Accum Inj Loops 3 & 4 Iso Vlv	Open

b. At least once per 31 days by:

1) Verifying that the ECCS piping is full of water by venting the ECCS pump casings and accessible discharge piping high points, and

2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1) For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and

2) Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.

d. At least once per 18 months by:

1) Verifying automatic ~~containment~~ interlock action of the RHR System from the Reactor Coolant System by ensuring that:

a) With a simulated or actual Reactor Coolant System pressure signal greater than or equal to 425 psig the interlocks prevent the valves from being opened, and

b) With a simulated or actual Reactor Coolant System pressure signal less than or equal to 750 psig the interlocks will cause the valves to automatically close.

CALLAWAY - UNIT 1 3/4 5-4

Figure 8-9. Proposed Callaway Surveillance Requirement 4.5.2.d.1

REVISION 1

REACTOR COOLANT SYSTEM

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; and

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 Each RHR suction relief valve shall be demonstrated OPERABLE when the RHR suction relief valves are being used for cold overpressure protection as follows:

a. For RHR suction relief valve 8708B:

1) By verifying at least once per 31 days that RHR RCS Suction Isolation Valve (RRSIV) 8701B is open with power to the valve operator removed, and

2) By verifying at least once per 12 hours that RRSIV 8702B is open.

b. For RHR suction relief valve 8708A:

1) By verifying at least once per 31 days that RRSIV 8702A is open with power to the valve operator removed, and

2) By verifying at least once per 12 hours that RRSIV 8701A is open.

c. Testing pursuant to Specification 4.0.5.

4.4.9.3.3 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.

CALLAWAY - UNIT 1 3/4 4-35

Figure 8-10. Proposed Callaway Surveillance Requirement 4.4.9.3.2

REVISION 1

REACTOR COOLANT SYSTEM

BASES

HEATUP (Continued)

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 nonductile 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, or two RHR suction relief valves, or an RCS vent opening of at least 2 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 368°F. Either PORV or either RHR suction relief valve 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 centrifugal charging pump and its injection into a water-solid RCS.

RHR/RCS suction isolation valves 8701A and B are interlocked with an "A" train wide range pressure transmitter and valves 8702A and B are interlocked with a "B" train wide range pressure transmitter. Removing power from valves 8701B and 8702A, prevents a single failure from inadvertently isolating both RHR suction relief valves while maintaining RHR isolation capability for both RHR flow paths.

In addition to opening RCS vents to meet the requirement of Specification 3.4.9.3c., it is acceptable to remove a pressurizer Code safety valve, open a PORV block valve and remove power from the valve operator in conjunction with disassembly of a PORV and removal of its internals, or otherwise open the RCS.

COLD OVERPRESSURE

The Maximum Allowed PORV Setpoint for the Cold Overpressure Mitigation System (COMS) is derived by analysis which models the performance of the COMS assuming various mass input and heat input transients. Operation with a PORV setpoint less than or equal to the maximum setpoint ensures that Appendix G criteria will not be violated with consideration for 1) a maximum pressure overshoot beyond the PORV setpoint which can occur as a result of time delays in signal processing and valve opening; 2) a 50°F heat transport effect made

Figure 8-11. Proposed Callaway Bases Section 3/4.4.9

ENCLOSURE 4 TO NYN-91079

SUPPLEMENTAL INFORMATION AND NO SIGNIFICANT HAZARDS CONSIDERATION FOR PROPOSED CHANGES TO TECHNICAL SPECIFICATION 3.4.9.3 (RHR SUCTION RELIEF VALVE SETPOINT CHANGE)

NHY's "Request for License Amendment: Residual Heat Removal System Isolation Valve Autoclosure Interlock Removal" also proposed a change to the RHR suction relief valve setpoint upper limit. Currently Technical Specification 3.4.9.3 states that the RHR suction relief valves have a setpoint of 450 psig $\pm$ 3%. The proposed change maintains the nominal relief valve setpoint of 450 psig but reduces the RHR suction relief valve setpoint upper limit to 450 psig +0, -3%. The effect of this proposed change is to reduce the maximum acceptable valve setpoint by 13.5 psig from 463.5 psig to 450.0 psig. This change in the RHR suction relief valve setpoint upper limit is proposed to conservatively ensure adequate overpressure protection for the RHR System as dictated by a re-analysis of the RHR suction relief valve capacity. The RHR suction relief valve capacity was re-analyzed, as was done by Westinghouse for the four referenced plants, and documented in WCAP-11736 - "Residual Heat Removal System Autoclosure Interlock Removal Report" (Section 9.0).

A summary of the Seabrook Station RHR relief valve capacity re-analysis is provided below which supports the RHR suction relief valve setpoint change. This re-analysis was performed by Yankee Atomic Electric Company (YAEC) for NHY. The YAEC calculation is identified as SBC-383 entitled "RHRS Overpressure Protection", dated June 26, 1990.

RHR RELIEF VALVE CAPACITY - SEABROOK STATION

The Seabrook Residual Heat Removal System (RHRS) is protected from inadvertent overpressurization by various code relief valves located throughout the system. Of these, primary protection is provided by individual suction line relief valves, located in each subsystem's RHRS pump suction line from the associated Reactor Coolant System (RCS) hot leg. The main purpose of the RHRS relief valves is to protect the RHRS from overpressurization during residual heat removal operation, and protect the RCS from overpressurization when the valves are qualified as OPERABLE in Technical Specification 3.4.9.3.a. The design basis overpressurization events for both the RCS and the RHRS include:

1. Inadvertent RCS mass addition by operation of one Centrifugal Charging Pump (CCP); or

2. Inadvertent RCS mass addition by operation of one Safety Injection Pump (SIP); or

3. Inadvertent RCS heat addition by operation of one Reactor Coolant Pump (RCP), with steam generators 50°F hotter than RCS temperature.

Events more limiting than these are precluded by Technical Specifications. Each design basis event is assumed to occur while the RCS is water solid and without letdown. To address the fact that operation with only one RHRS train open to the RCS is permitted, only one RHRS relief valve is credited for RHRS overpressure protection. This is conservative, since technical specifications require both relief valves OPERABLE when used for RCS overpressure protection.

The RHRS relief valves have oversized disk assemblies and balanced bellows, allowing full lift essentially at the opening pressure. Each RHRS relief valve is rated for 900 gpm at the 450 psig opening setpoint, relieving 400°F water against a backpressure of 3 psig constant plus 50 psig buildup due to flow resistance in the discharge piping. The valve discharge is piped to the Pressurizer Relief Tank (PRT) which is normally operated with a nitrogen cover pressure of 3 psig. The PRT is protected from overpressurization by two rupture disks having a release pressure of 86 to 100 psig.

Inadvertent mass addition from the operation of either one CCP or one SIP could occur over the full range of allowable RHRS operation from ambient to 350°F RCS temperature. At the 450 psig RHRS relief valve setpoint, one CCP or one SIP has a capacity of 425 gpm or 565 gpm respectively. It was verified by calculation that one RHRS relief valve can pass more than 635 gpm at the 450 psig setpoint for fluid temperatures up to 350°F. This includes an allowance for discharge piping flow resistance and an maximum PRT backpressure of 100 psig. The maximum pressure for these mass addition transients is limited to the opening setpoint of 450 psig at the RHRS relief valve location. This is less than the limit for low temperature RCS overpressure protection required by Appendix G of 10 CFR 50 as required by Technical Specifications.

It was verified by calculation that a relief rate of 581 gpm will accommodate the inadvertent heat addition transient for RCS temperatures up to 250°F. Steps in several plant operating procedures prevent the start of an RCP when the RCS is solid and greater than 200°F. From above, one RHRS relief valve can pass more than 635 gpm at the 450 psig setpoint for fluid temperatures up to 350°F. The maximum pressure for this heat addition transient is limited to the opening setpoint of 450 psig at the RHRS relief valve location. This is less than the limit for low temperature RCS overpressure protection required by Appendix G of 10 CFR 50 as required by Technical Specifications.

The maximum pressure for all the design basis overpressure transients is limited to 450 psig at the RHRS relief valve location. However the possibility of an operating RHRS pump and the lower elevation of RHRS pump suction and discharge piping in the equipment vault will produce local fluid pressure above the 450 psig relief valve setpoint. The design overpressure limit of the RHRS is 660 psig (110% of design pressure as required by the ASME Code Section NC-7311). It was verified by calculation that the maximum RHRS pressures are less than 660 psig in the pump suction and discharge piping.

In summary, each RHRS relief valve and discharge system has sufficient capacity to provide RHRS and RCS overpressure protection against the specified design basis events when the opening setpoint is $\leq$450 psig.

NHY has determined that the proposed RHR suction relief valve setpoint upper limit change does not introduce a significant hazard consideration pursuant to the requirements of 10CFR50.92. The basis for this determination is provided below:

1. The proposed change in the RHR suction relief valve setpoint upper limit does not involve a significant increase in the probability or consequences of an accident previously evaluated. The relief valve setpoint change has no effect on the probability of occurrence of a Reactor Coolant System (RCS) mass or heat addition transient which may require the RHR suction relief valves to protect the RHR system and the RCS from overpressurization. The consequences of a RCS mass or heat addition transient are not increased, as the relief valve setpoint change is intended to conservatively ensure that adequate overpressure protection is provided. The proposed change in the RHR suction relief valve setpoint is primarily attributable to the reanalysis of the RHR suction relief valve capacity by Atomic Yankee Electric Company in calculation SBC-383, "RHRS Overpressure Protection" dated June 26, 1990. NHY reviewed actual RHR suction relief valve setpoints determined during testing. The actual RHR suction relief valve setpoints were below 450 psig, thus RHR overpressurization would have been precluded in a mass or heat addition transient.

2. The proposed change in the RHR suction relief valve upper limit will not create the possibility of a new or different kind of accident from any previously evaluated. The RHR suction relief valve function is to protect the RHR system from overpressurization during a RCS mass or heat addition transient. Additionally, the RHR suction relief valves may be utilized to provide RCS cold overpressure protection as provided by Technical Specification 3.4.9.3. The change in RHR suction relief valve setpoint upper limit will ensure that this overpressure protection function is provided. No change to the RHR suction relief valve lower limit setpoint has been proposed, therefore the probability of an inadvertent opening of the RHR suction relief valves is not increased. No new or different types or accidents will be created by the RHR suction relief valve setpoint upper limit change.

3. The proposed change in the RHR suction relief valve setpoint upper limit will not significantly reduce the margin of safety associated with the overpressure protection function of these valves. The proposed revised relief setpoint will maintain the margin of safety associated with the RHR suction relief valve overpressure protection function by assuring that the maximum opening setpoint does not exceed the maximum opening setpoint which has been conservatively analyzed. The actual RHR suction relief valve setpoint is verified as part of NHY Inservice Test Program requirements for these valves.