VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

July 31, 2009

Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth Street, S. W., Suite 23T85
Atlanta, Georgia 30303-8931

Serial No. 09-510
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Dear Mr. Reyes:

**VIRGINIA ELECTRIC AND POWER COMPANY**
**SURRY POWER STATION UNITS 1 AND 2**
**WRITTEN LICENSE EXAMINATION COMMENTS**

In accordance with NUREG-1021, Section ES-402, the following comments are submitted concerning the Reactor Operator and Senior Reactor Operator written initial examinations administered at Surry on July 29, 2009.

**SRO QUESTION: #86 (K/A 015/017.AG2.2.22)**

The question as given to the applicants follows:

Initial plant conditions on Unit 2 are as follows:

- A power increase is in progress following reactor startup.
- Reactor power is at 8%.
- Pressurizer Spray valve 2-RC-PCV-2455A cannot be opened.
- All three RCPs are operating.
- Normal Charging has been tagged out at 1-CH-MOV-1289A and excess letdown is in-service due to required charging line piping repairs.

Current plant conditions on Unit 2 are as follows:

- RCP 'C' trips on ground overcurrent.

Based on the above conditions, which ONE of the following describes whether action statements of the following LCOs are required to be performed:

- Technical Specification Section 3.1.A.4 (Reactor Coolant Loops)
- Technical Specification Section 3.1.A.5 (Pressurizer)

Action statements within...

a. Technical Specification Section 3.1.A.4 is required.
Technical Specification Section 3.1.A.5 is NOT required.

b. Technical Specification Section 3.1.A.4 is NOT required.
Technical Specification Section 3.1.A.5 is required.

c. both Technical Specification Section 3.1.A.4 and 3.1.A.5 are required.

d. neither Technical Specification Section 3.1.A.4 nor 3.1.A.5 are required.

**Current ANSWER:** (C)

**COMMENTS:**

Issue #1

Given the Unit conditions presented in the stem of the question, Technical Specification 3.1.A.4 is NOT required and Technical Specification 3.1.A.5 is applicable.

Technical Specification 3.1.A.4 (Reactor Coolant Loops) is applicable for Loop Stop Valves and the associated Reactor Coolant Loops, not Reactor Coolant Pumps. Technical Specification 3.1.A.1 (Reactor Coolant Pumps) is the correct Technical Specification that would be applicable for the conditions given within the question (i.e., loss of motive force/RCP in the 'C' Reactor Coolant Loop). As such, Technical Specification 3.1.A.4 is not applicable.

Additionally, although Technical Specification 3.1.A.4 states that, "POWER OPERATION with less than three loops in service is prohibited" this statement is made with regards to Reactor Coolant Loops, vice Reactor Coolant Pumps. This is clarified within the specification as the follow-on statements are related only to Reactor Coolant Loop Isolation Valves, as is the basis section of this Technical Specification. Additional clarification for returning a Reactor Coolant Loop to service is contained within Technical Specification 3.17 (Loop Stop Valve Operation). Technical Specification 3.17 states that in order to return a loop to service (i.e., have a loop in service) certain items must be met (see highlight areas in Attachment 1). When discussing returning a Reactor Coolant Loop to service in Technical Specification 3.1.A.4. and 3.17 (and their associated basis sections), there is no discussion on Reactor Coolant Pump Operation. Finally, statements within UFSAR Chapter 4 support this argument.

Attachment 1 contains the associated Technical Specifications and Basis information to support this conclusion.

Issue #2

The question stem asks the candidate to determine, "*Based on the above conditions, which ONE of the following describes whether action statements of the following LCOs are required to be performed*". Technical Specification 3.1.A.4 has no applicable action statements to be performed. As such, action statements within Technical Specification Section 3.1.A.4 are NOT required.

**RECOMMENDATION:**

Issue 1 and 2 resolution:

Based on the above information the correct answer for this question should be (B), as Technical Specification 3.1.A.4 is not applicable and 3.1.A.5 is applicable. Additionally, Technical Specification 3.1.A.4 contains no action statements to be performed.

**REFERENCES**:

- Technical Specification section 3.1.A.1 and associated basis
- Technical Specification section 3.1.A.4 and associated basis
- Technical Specification section 3.17 (Loop Stop Valve Operation)
- Excerpts from UFSAR Chapter 4

**SRO QUESTION: #93 (K/A 079.G2.2.22)**

Given the following plant conditions:

- Unit 1 is at 100%
- A loss of Containment Instrument Air has occurred
- 1B-F6, CTMT INST AIR HDR LO PRESSURE, annunciates
- 1D-C6, PRZR PWR RELIEF VV LO AIR PRESS, annunciates
- Containment Instrument Air was crosstied with Instrument Air
- Containment Instrument Air Pressure = 85 psig and increasing
- All Pressurizer PORV air bottles are properly aligned with air pressures of 1050 psig

Which ONE of the following correctly states (1) the status of LCO 3.1.A.6 (PORV Operability) and (2) the Technical Specification required operator actions, if any?

a. (1) The LCO is met.
   (2) No further action associated with the Pressurizer PORVs is required.

b. (1) The LCO is met.
   (2) Verify Pressurizer PORV operability by closing Pressurizer PORV Block Valves, manually cycle the Pressurizer PORVs, and then re-open the Pressurizer PORV Block Valves.

c. (1) The LCO is NOT met.
   (2) Restore the Pressurizer PORV backup air supply within 14 days OR be in HSD within the next 6 hours.

d. (1) The LCO is NOT met.
   (2) Close and remove power from both Pressurizer PORV block valves within one hour AND be in HSD within the next 6 hours

**Current ANSWER:** (A)

**COMMENTS:**

Given the Unit conditions presented in the stem of the question, Technical Specification 3.1.A.6 is NOT met.

The conditions given in the question state that annunciator 1D-C6 (PRZR PWR RELIEF VV LO AIR PRESS) has actuated and that Pressurizer PORV air bottles are pressurized to 1050 psig. Since annunciator 1D-C6 will only annunciate when Pressurizer PORV air bottle pressure is less than 1000 psig or when Pressurizer PORV Back-up Air System (i.e., air pressure downstream of the pressure regulator) is less than 80 psig, it can logically be concluded that the cause of the alarm was due to low air pressure downstream of the pressure regulator.

Since air pressure downstream of the pressure regulator is less than 80 psig, the PORVs must be declared inoperable in accordance with ARP 1D-C6 Step 4 and Technical Specification 3.1.A.6. This means that the LCO for 3.1.A.6 is NOT met and that the required operator actions are to restore the Pressurizer PORV backup air supply within 14 days OR be in HSD within the next 6 hours

Attachment 2 contains the associated Technical Specification and Procedure to support this conclusion.

**RECOMMENDATION:**

Based on the above information the correct answer for this question should be (C), the ARP and plant conditions show the Technical Specification is NOT met.

**REFERENCES**:

- Annunciator response procedure 1D-C6 (PRZR PWR RELIEF VV LO AIR PRESS).
- Technical Specification section 3.1.A.6 and associated basis.

If you have any questions or require additional information, please contact us.

Very truly yours,

Gerald T. Bischof
Site Vice President
Surry Power Station

Attachments

- Attachment 1 – Supporting Reference material for Question 86
- Attachment 2 – Supporting Reference material for Question 93

copy:

Mr. Malcolm Widmann
United States Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, S. W., Suite 23T85
Atlanta, Georgia 30303-8931

Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Senior Resident Inspector
Surry Power Station

ATTACHMENT 1

# WRITTEN LICENSE EXAMINATION COMMENTS

## REFERENCE MATERIAL TO SUPPORT COMMENTS

## SRO QUESTION: #86

Surry Power Station - Units 1 & 2

VIRGINIA ELECTRIC AND POWER COMPANY

## 3.1 REACTOR COOLANT SYSTEM

Applicability

Applies to the operating status of the Reactor Coolant System.

Objectives

To specify those limiting conditions for operation of the Reactor Coolant System which must be met to ensure safe REACTOR OPERATION.

These conditions relate to: operational components, heatup and cooldown, leakage, reactor coolant activity, oxygen and chloride concentrations, minimum temperature for criticality, and Reactor Coolant System overpressure mitigation.

A. Operational Components

Specifications

1. Reactor Coolant Pumps

   a. A reactor shall not be brought critical with less than three pumps, in non-isolated loops, in operation.

4. Reactor Coolant Loops

   a. Loop stop valves shall not be closed in more than one loop unless the Reactor Coolant System is connected to the Residual Heat Removal System and the Residual Heat Removal System is OPERABLE.

   b. POWER OPERATION with less than three loops in service is prohibited. The following loop isolation valves shall have AC power removed and their breakers locked, sealed or otherwise secured in the open position during POWER OPERATION:

| Unit No. 1 | Unit No. 2 |
|---|---|
| MOV 1590 | MOV 2590 |
| MOV 1591 | MOV 2591 |
| MOV 1592 | MOV 2592 |
| MOV 1593 | MOV 2593 |
| MOV 1594 | MOV 2594 |
| MOV 1595 | MOV 2595 |

5. Pressurizer

   a. The reactor shall be maintained subcritical by at least 1% until the steam bubble is established and the necessary sprays and at least 125 KW of heaters are operable.

   b. With the pressurizer inoperable due to inoperable pressurizer heaters, restore the inoperable heaters within 72 hours or be in at least HOT SHUTDOWN within 6 hours and the Reactor Coolant System temperature and pressure less than 350°F and 450 psig, respectively, within the following 12 hours.

   c. With the pressurizer otherwise inoperable, be in at least HOT SHUTDOWN with the reactor trip breakers open within 6 hours and the Reactor Coolant System temperature and pressure less than 350°F and 450 psig, respectively, within the following 12 hours.

The following paragraph contains the basis section for Technical Specification 3.1.A.1:

Basis

Specification 3.1.A-1 requires that a sufficient number of reactor coolant pumps be operating to provide coastdown core cooling flow in the event of a loss of reactor coolant flow accident. This provided flow will maintain the DNBR above the applicable design limit.[1] Heat transfer analyses also show that reactor heat equivalent to approximately 10% of rated power can be removed with natural circulation; however, the plant is not designed for critical operation with natural circulation or one loop operation and will not be operated under these conditions.

The following paragraph contains the basis section for Technical Specification 3.1.A.4:

The limitation specified in item 4 above on reactor coolant loop isolation will prevent an accidental isolation of all the loops which would eliminate the capability of dissipating core decay heat when the Reactor Coolant System is not connected to the Residual Heat Removal System.

## 3.17 LOOP STOP VALVE OPERATION

Applicability

Applies to the operation of the loop stop valves.

Objective

To specify those limiting conditions for operation of the loop stop valves which must be met to ensure safe reactor operation.

Specifications

1. The loop stop valves shall be maintained open unless the reactor is in COLD SHUTDOWN or REFUELING SHUTDOWN.

2. A hot or cold leg stop valve in a reactor coolant loop may be closed in COLD SHUTDOWN or REFUELING SHUTDOWN for up to 2 hours for valve maintenance or testing. If the stop valve is not opened within 2 hours, the loop shall be isolated.

3. Whenever a reactor coolant loop is isolated, the stop valves of the isolated loop shall have their AC power removed and their breakers locked open.*

4. Whenever an isolated and filled reactor coolant loop is returned to service, the following conditions shall be met:

   a. A source range nuclear instrumentation channel shall be operable and continuously monitored with audible indication in the control room during opening of the hot leg loop stop valve, during relief line flow, and when opening the cold leg stop valve in the isolated loop. Should the count rate increase by more than a factor of two over the initial count rate, the hot and cold leg stop valves shall be re-closed and no attempt made to open the stop valves until the reason for the count rate increase has been determined.

---

* Power may be restored to a hot or cold leg loop stop valve in an isolated and filled loop provided the requirements of Specifications 4.b or 4.c are met, respectively. Power may be restored to a loop stop valve in an isolated and drained loop provided the requirements of Specifications 5.a and b are met.

Basis Section of Technical Specification 3.17

Basis

The Reactor Coolant System may be operated with isolated loops in COLD SHUTDOWN or REFUELING SHUTDOWN in order to perform maintenance. A loop stop valve in any loop can be closed for up to two hours without restriction for testing or maintenance in these operating conditions. While operating with a loop isolated, AC power is removed from the loop stop valves and their breakers locked opened to prevent inadvertent opening. When the isolated loop is returned to service, the coolant in the isolated loop

TS 3.17-5
05-22-01

mixes with the coolant in the active loops. This situation has the potential of causing a positive reactivity addition with a corresponding reduction of shutdown margin if:

a. The temperature in the isolated loop is lower than the temperature in the active loops (cold water accident), or

b. The boron concentration in the isolated loop is insufficient to maintain the required shutdown margin (boron dilution accident).

The return to service of an isolated and filled loop is done in a controlled manner that precludes the possibility of an uncontrolled positive reactivity addition from cold water or boron dilution. A flow path to mix the isolated loop with the active loops is established through the relief line by opening the hot leg stop valve in the isolated loop and starting the reactor coolant pump. The relief line flow is low enough to limit the rate of any reactivity addition due to differences in temperature and boron concentration between the isolated loop and the active loops. In addition, a source range instrument channel is required to be operable and continuously monitored to detect any change in core reactivity.

Basis Section of Technical Specification 3.17 (continued)

The limiting conditions for returning an isolated and filled loop to service are as follows:

a. A hot leg loop stop valve may not be opened unless the boron concentration in the isolated loop is greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

b. A cold leg loop stop valve can not be opened unless the hot leg loop stop valve is open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm. In addition, the cold leg temperature of the isolated loop must be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. The boron concentration in the isolated loop must be verified to be greater than or equal to the boron concentration corresponding to the shutdown margin requirements for the active portion of the Reactor Coolant System.

c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition during hot or cold leg stop valve opening and during relief line flow.

Amendment Nos. 226 and 226

Thermal sleeves are installed at the following locations where high thermal stresses could otherwise develop due to rapid changes in fluid temperature during normal operational transients:

1. Return line from the residual heat removal loop.
2. Both ends of the pressurizer surge line.
3. Pressurizer spray line connection to the pressurizer.
4. Charging line connection.
5. Loop fill header connections to each loop.

4.2.2.7 **Small Valves**

All valve surfaces in contact with reactor coolant are austenitic stainless steel or equivalent corrosion-resistant materials. Connections to stainless steel piping are welded.

Valves that perform a modulating function are equipped with two sets of packing and an intermediate leakoff connection.

4.2.2.8 **Loop Stop Valves**

The reactor coolant loop stop valves, one of which is shown on Figure 4.2-8, are remotely controlled, motor-operated gate valves that permit any loop to be isolated from the reactor vessel during cold or refueling shutdowns. A stop valve is installed on each hot leg and in each cold leg. During return to service of an isolated filled loop, coolant is circulated through a bypass line, which contains a remotely controlled, motor-operated stop valve. This bypass valve is closed during normal loop operation. A valve pump interlock circuit prevents the starting of the reactor coolant pump in a given loop unless either (a) both hot leg and cold leg loop stop valves are open or (b) the cold leg loop stop valve is closed and the bypass valve is open. The interlock also prevents pump operation if the bypass valve and either of the stop valves are closed.

To ensure against an accidental start-up of an unborated and/or cold isolated loop, an additional valve interlock system is provided that meets the IEEE-279 *Criteria for Nuclear Power Plant Protection Systems,* August 1968. This is shown on Reference Drawing 1, which indicates a relief line and bypass around the cold-leg stop valve. These additional valve temperature and flow interlocks require that a controlled flow of reactor coolant is circulated through the relief line of the inactive loop insuring that boron concentration and temperature of the isolated loop are brought to equilibrium with the remainder of the reactor coolant system, prior to opening the cold leg loop stop valve. This controlled flow will minimize the possibility of a sudden reactivity addition from cold water or boron dilution.

The valve-temperature and valve-flow relief line interlocks are provided to:

1. Prevent opening of a hot-leg loop stop valve unless the cold-leg loop stop valve is closed.

UFSAR Chapter 4 (continued):



2. Prevent opening of a cold-leg loop stop valve unless:
   a. The hot-leg loop stop valve has been opened a specified time.
   b. The loop bypass valve has been opened a specified time.
   c. Flow has existed through the relief line for a specified time.
   d. The cold-leg temperature is within 20°F of the highest cold-leg temperature in other loops and the hot-leg temperature is within 20°F of the highest hot-leg temperature in the other loops.

Returning an isolated loop to service requires that the above interlocks be satisfied, a minimum temperature exists in the loop, and that core reactivity be monitored using a source range nuclear instrument channel.

If a loop was initially drained, the above interlocks can be bypassed. The initially isolated and drained loop may be returned to service by partially opening a loop stop valve and filling the loop in a controlled manner from the reactor coolant system. If using the Volume Control Tank (VCT) as the makeup source, the charging flow from the VCT is periodically sampled during the backfill evolution to ensure its boron concentration meets the minimum refueling water boron concentration requirement established by Technical Specification 3.10.A.9. Makeup to the Reactor Coolant System solely through auxiliary spray during the backfill evolution is prohibited to ensure that a sufficient fraction of makeup flow is mixed with coolant in the active Reactor Coolant System volume and flows through the core, where the source range instrumentation is available to provide secondary indication of improperly blended makeup flow. The vacuum-assisted backfill evolution involves initiation of reactor coolant pump seal injection in the isolated and drained loop to allow establishment of a partial vacuum prior to partially opening the cold leg loop stop valve. The following controls are required to assure that no sudden positive reactivity addition or loss of reactor coolant system inventory occurs during the backfill evolution:

1. Only one loop should be filled at a time.
2. The isolated loop must be verified to be drained.
3. Adequate reactor coolant inventory exists to assure that, during the fill operation, decay heat removal is maintained. This minimum inventory level should not be violated during the fill operation.

If this method is used to fill a loop, then the loop is no longer considered to be isolated and the requirements for returning the isolated loop to service are not applicable as long as the loop stop valves are opened within a specified time.

The parameters of each reactor coolant loop stop valve are shown in Table 4.1-7.

ATTACHMENT 2

# WRITTEN LICENSE EXAMINATION COMMENTS

## REFERENCE MATERIAL TO SUPPORT COMMENTS

## SRO QUESTION: #93

**Surry Power Station - Units 1 & 2**

Dominion

SURRY POWER STATION

ANNUNCIATOR RESPONSE PROCEDURE

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 1 of 6 |

REFERENCES 1D-22

1) UFSAR 4.0
2) 11448-ESK-10C, 10AN
3) Tech Spec 3.1.G, 3.1.A
4) 1-DRP-005, Instrument Setpoints
5) DCP 93-054-3, Reassessed CRDR - Outage Related (Relocation)
6) DCP 93-037-3, PORV Backup Air System Modifications
7) Tech Spec Amendment 198
8) 11448-FM-75E, Sheet 2
9) Tech Spec Amendment 231
10) TRM 3.7.18
11) PI S-2005-3320, PORV Air Bottle Pressure
12) DCP 05-043, PRZR PORV Air Bottle Cameras
13) PI S-2006-1699, PORV Air Bottle Pressure

PROBABLE CAUSE

1) Alarm actuates when PS-IA-104A or PS-IA-104B senses backup air bottle pressure less than or equal to 1000 psig.
2) Alarm actuates when PS-IA-103A or PS-IA-103B senses PORV Backup Air System pressure less than or equal to 80 psig downstream of air bottle regulator.
3) Instrumentation failure has occurred.

***CONTINUOUS USE***

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 2 of 6 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|

**NOTE:**
- During normal operation, a PORV is inoperable if less than two air bottles are in service or bottle pressure is less than 1000 psig. If two air bottles (each with greater than 1000 psig) cannot be maintained aligned to the associated PORV, the applicable Tech Spec clock must be entered.
- When OPMS is required, a PORV is inoperable if two bottles are in service with less than 1269 psig or three bottles are in service with less than 1000 psig. If two air bottles (each with greater than 1269 psig) OR three bottles (each with greater than 1000 psig) cannot be maintained aligned to the associated PORV, the applicable Tech Spec clock must be entered.
- The PORV remote monitors should be used to verify alarm before declaring PORVs inoperable or making CTMT entry. If bottle pressure and regulator pressure unavailable on monitors, this procedure should be initiated starting with Step 2.

1. ___ CHECK PORV AIR BOTTLE AND REGULATOR PRESSURE ON REMOTE MONITORS

☐ • Either in-service air bottle pressure - LESS THAN OR EQUAL TO 1000 PSIG

OR

☐ • Either regulator downstream pressure - LESS THAN OR EQUAL TO 80 PSIG

Air Bottle pressure given as 1050 psig. Therefore regulator downstream pressure must be less than or equal to 80 psig.

Do the following:

☐ a) Increase surveillance of local monitors.

☐ b) Submit Condition Report to investigate annunciator.

c) IF air bottle pressure greater than 1000 psig, but less than required based on notes above, THEN do the following:

☐ 1) IF RCS temperature less than 350°F, THEN GO TO Step 2 RNO.

☐ 2) IF RCS temperature greater than or equal to 350°F, THEN GO TO Step 3.

☐ d) IF air bottle pressure adequate, THEN GO TO Step 14.

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 3 of 6 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|

**NOTE:** The PRZR PORVs are required for the mitigation of a Steam Generator tube rupture when the RCS is greater than 350°F.

2.___ CHECK RCS TEMPERATURE - GREATER THAN OR EQUAL TO 350°F

Plant conditions were given as 100% power.

IF the vessel head is bolted AND the PORVs are providing Overpressure Protection, THEN do the following:

- ☐ a) Declare PORVs inoperable.
- ☐ b) Review Tech Spec 3.1.G.
- ☐ c) GO TO Step 5.

IF the vessel head is NOT bolted AND the PORVs are NOT providing Overpressure Protection, THEN do the following:

- ☐ a) Locally check PORV air bottle and regulator pressure.
- ☐ b) GO TO Step 14.

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 4 of 6 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|

**NOTE:** A PORV is capable of being manually cycled if CTMT IA pressure is greater than 80 psig and power is available to the PORV.

*3.___ CHECK BOTH PORVS - CAPABLE OF BEING MANUALLY CYCLED

☐ • Normal CTMT IA pressure greater than 80 psig - AVAILABLE (PI-IA-101)

AND

• Power to PORVs - AVAILABLE

☐ • 1-RC-PCV-1456, DC Panel 1-2, Bkr 8

☐ • 1-RC-PCV-1455C, DC Panel 1-1, Bkr 5

Plant conditions were given as CTMT IA pressure at 85 psig and no data given on the PORV power supplies, so they are available.

4.___ DECLARE PRZR PORVS INOPERABLE DUE TO INOPERABLE AIR SUPPLY AND START 14 DAY CLOCK IAW TECH SPEC 3.1.A.6.f

5.___ REVIEW TRM 3.7.18

Do the following:

a) Within one hour, close and deenergize the PORV Block valve for PORV(s) which can NOT be manually cycled:

☐ • 1H1-2S 6A for 1-RC-MOV-1535

☐ • 1J1-2W 8A for 1-RC-MOV-1536

b) Initiate annunciator response procedure(s) as necessary:

☐ • 1B-F6, CTMT INST AIR HDR LO PRESS

☐ • 1B-F5, CTMT INST AIR COMPR TRBL

☐ c) Review Tech Spec 3.1.A.6.b and 3.1.A.6.c.

☐ d) GO TO Step 5.

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 5 of 6 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|

**NOTE:**
- There are four backup air bottles for each PORV. Two are normally valved in and two are normally isolated.
- Backup air bottle pressure is needed for long-term ability to cycle PORVs. If PORV air bottle pressure is less than 1000 psig or downstream regulator pressure is less than 80 psig and the RCS is greater than 350°F, a 14 day clock to restore the PORV(s) backup air supply(ies) must be started. This clock may be stopped when the low pressure condition is corrected.

6. ___ LOCALLY OR REMOTELY CHECK IN-SERVICE AIR BOTTLE PRESSURE ON BOTH PORVs - EITHER LESS THAN 1000 PSIG

☐ IF air bottle pressure greater than 1000 psig, but less than required, THEN GO TO Step 7.

IF pressure downstream of either PORV bottle regulator less than 80 psig, THEN do the following:

☐ a) Direct I & C to adjust regulator(s). IF greater than 80 psig obtained, THEN GO TO Step 12.

b) IF pressure can NOT be increased to greater than 80 psig, THEN do the following:

☐ 1) Initiate Condition Report to repair failed regulator(s).

☐ 2) GO TO Step 14.

☐ IF pressure downstream of both regulators greater than 80 psig, THEN initiate a Condition Report AND GO TO Step 12.

7. ___ LOCALLY INVESTIGATE AND IDENTIFY AIR LEAKS AS NECESSARY

8. ___ SWAP PORV AIR BOTTLES IAW 1-OP-IA-007, SWAPPING PRZR PORV AIR BOTTLES

| NUMBER | PROCEDURE TITLE | REVISION |
|---|---|---|
| 1D-C6 | PRZR PWR RELIEF VV LO AIR PRESS | 9 |
| | | PAGE 6 of 6 |

| STEP | ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED |
|---|---|---|
| 9. | CHECK AIR BOTTLE PRESSURE ON BOTH PORVs - GREATER THAN REQUIRED PRESSURE | ☐ GO TO Step 14. |
| 10. | CHECK PRESSURE DOWNSTREAM OF BOTH BOTTLE REGULATORS - GREATER THAN 80 PSIG | ☐ Direct I & C to adjust regulator(s). IF greater than 80 psig obtained, THEN GO TO Step 11.<br><br>IF pressure can NOT be increased to greater than 80 psig, THEN do the following:<br><br>☐ a) Initiate Condition Report to repair failed regulator(s).<br><br>☐ b) GO TO Step 14. |
| 11. | INITIATE A CONDITION REPORT TO HAVE EMPTY AIR BOTTLES REPLACED | |
| 12. | VERIFY COMPLIANCE WITH APPLICABLE TECH SPEC | |
| 13. | DECLARE PORVs OPERABLE | |
| 14. | PROVIDE NOTIFICATIONS AS NECESSARY:<br>☐ • OMOC<br>☐ • STA<br>☐ • Shift Supervision | |

- END -

6. Relief Valves

Two power operated relief valves (PORVs) and their associated block valves shall be OPERABLE* whenever the Reactor Coolant System average temperature is ≥ 350°F.

a. With one or both PORVs inoperable but capable of being manually cycled, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s) and maintain power to the associated block valve(s). Otherwise, be in at least HOT SHUTDOWN within the next 6 hours and reduce Reactor Coolant System average temperature to < 350°F within the following 6 hours.

b. With one PORV inoperable and not capable of being manually cycled, within 1 hour either restore the PORV to OPERABLE status or capable of being manually cycled or close the associated block valve and remove power from the block valve. In addition, restore the PORV to OPERABLE status or capable of being manually cycled within the following 72 hours. Otherwise, be in at least HOT SHUTDOWN within the next 6 hours and reduce Reactor Coolant System average temperature to < 350°F within the following 6 hours.

c. With both PORVs inoperable and not capable of being manually cycled, within 1 hour restore at least 1 PORV to OPERABLE status or capable of being manually cycled. Otherwise, close the associated block valves and remove power from the block valves. In addition, be in HOT SHUTDOWN within the next 6 hours and reduce Reactor Coolant System average temperature to < 350°F within the following 6 hours.

* Automatic actuation capability may be blocked when Reactor Coolant System pressure is below 2010 psig.

d. With one block valve inoperable, within 1 hour either restore the block valve to OPERABLE status or place the associated PORV in manual. In addition, restore the block valve to OPERABLE status in the next 72 hours or, be in at least HOT SHUTDOWN within the next 6 hours and reduce reactor coolant average temperature to <350°F within the following 6 hours.

e. With both block valves inoperable, within 1 hour either restore the block valves to OPERABLE status or place the associated PORVs in manual. Restore at least 1 block valve to OPERABLE status within the next hour or, be in at least HOT SHUTDOWN within the next 6 hours and reduce reactor coolant average temperature to <350°F within the following 6 hours.

f. With one or both PORV(s) inoperable (but capable of being manually cycled) because of an inoperable backup air supply, within 14 days either restore the PORV(s) backup air supply(ies) to OPERABLE status or be in at least HOT SHUTDOWN within the next 6 hours and reduce Reactor Coolant System average temperature to < 350°F within the following 6 hours.

7. Reactor Vessel Head Vents

a. At least two Reactor Vessel Head vent paths consisting of two isolation valves in series powered from emergency buses shall be OPERABLE and closed whenever RCS temperature and pressure are >350°F and 450 psig.

TS 3.1-5c
05-31-02

The power operated relief valves (PORVs) operate to relieve Reactor Coolant System pressure below the setting of the pressurizer code safety valves. The PORVs and their associated block valves may be used by the unit operators to depressurize the Reactor Coolant System to recover from certain transients if normal pressurizer spray is not available. Specifically, cycling of the PORVs is required to mitigate the consequences of a design basis steam generator tube rupture accident. Therefore, whenever a PORV is inoperable, but capable of being manually cycled, the associated block valve will be closed with its power maintained. The capability to cycle the PORVs is verified during each refueling outage (and is not required during power operations). These relief valves have remotely operated block valves to provide a positive shutoff capability should a relief valve leak excessively. The electrical power for both the relief valves and the block valves is supplied from an emergency power source to ensure the ability to seal this possible Reactor Coolant System leakage path.

With one or both PORVs inoperable (but capable of being manually cycled) due to an inoperable backup air supply, continued operation for 14 days is allowed provided the normal motive force for the PORVs, i.e., the instrument air system, continues to be available. Instrument air has a high system reliability, and the likelihood of it being unavailable during a demand for PORV operation is low enough to justify a reasonable length of time (i.e., 14 days) to repair the backup air system.

The accumulation of non-condensable gases in the Reactor Coolant System may result from sudden depressurization, accumulator discharges and/or inadequate core cooling conditions. The function of the Reactor Vessel Head Vent is to remove non-condensable gases from the reactor vessel head. The Reactor Vessel Head Vent is designed with redundant safety grade vent paths. Venting of non-condensable gases from the pressurizer steam space is provided primarily through the Pressurizer PORVs. The pressurizer is, however, equipped with a steam space vent designed with redundant safety grade vent paths.

References

(1) UFSAR Section 14.2.9

(2) UFSAR Section 14.2.10