

ML 19239A458

2019 Farley NRC Written Exam

QUESTION #2

The following conditions exist on Unit 1:

The unit is at 100% Power.

Subsequently, the following is observed:

The 1C RCP trips.

Which one of the following completes the statements below at 60 seconds after the 1C RCP trips?

1C SG Pressure in ____ (1) ____.

1B SG Pressure is ____ (2) ____.

- A. Rising, Rising
- B. Rising, Falling
- C. Falling, Rising
- D. Falling, Falling

Answer is KEYED for (A)

Recommendations: Recommend deleting this question from the exam due to no correct answer being provided. As ran on the plant referenced simulator, steam generator pressures rise rapidly for approximately 40 seconds after the initiating event followed by stabilization at approximately 55 seconds and beyond.

Basis:

1. This question asks the examinee to predict what a trend of Steam Generator (SG) pressures would be at a specific time after trip of a Reactor Coolant Pump from 100% power. It asks for trends of both an affected loop and unaffected loop. The question asks the examinee to identify the direction of the trend (bolded and underlined) "at 60 seconds after"
2. Simulator Integrated Plant Computer (IPC) trends were analyzed after the loss of an RCP. Based on the trends (attached) Steam generator pressures rise rapidly for approximately 40 seconds after the initiating event followed by stabilization at approximately 55 seconds and beyond with steam dumps operating to maintain pressure.
3. See attached IPC trends from the Plant Reference Simulator for BOL, MOL, EOL conditions. IPC trends represent a trip of the C RCP, and values for B/C SG pressures as provided in the stem.
4. Looking at the specificity of the time stated in the question and the trends from the IPC, the correct answer is - stable for both SGs. The correct answer was not provided on the exam.
5. Based on the exam validation genealogy and exam question analysis this question was originally written to test knowledge of the comparison of steam generator pressure from 100% steady state power to that following a RCP trip and reactor trip. Iterative changes and adjustments to the wording resulted in a different question than originally validated. The final exam version of the question asks the trend at a specific moment in time (60 seconds) and contains no correct answer.

ALARM

S C H B Z I

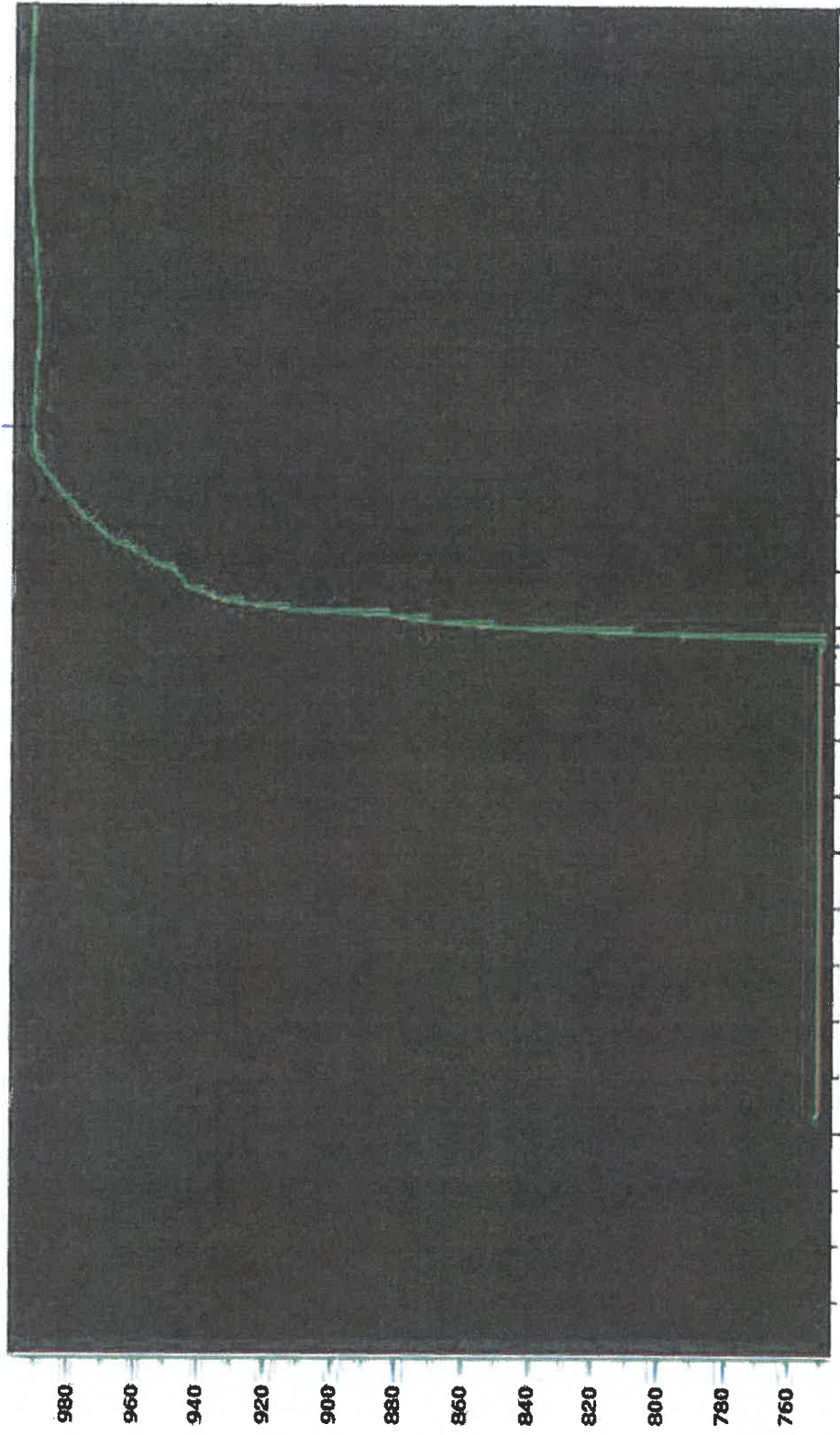
28 JUN 2019 11:08:15

CURRENT FUNCTION: T2

FNP Simulator

NEW DISPLAY ▶ GROUP: TEMGRP01
NEW GROUP ▶ DESCR:

Page 1 of 1



PT0484
PT0494

SG B OUTLET PRESSURE CHAN 2
SG C OUTLET PRESSURE CHAN 2

990.9 PSIG
990.9 PSIG

9999.0
9999.0

ALARM

SCHIZI

AMF

CURRENT FUNCTION: T2

FNP Simulator

28-JUN-2019 11:18:10

NEW DISPLAY ▶

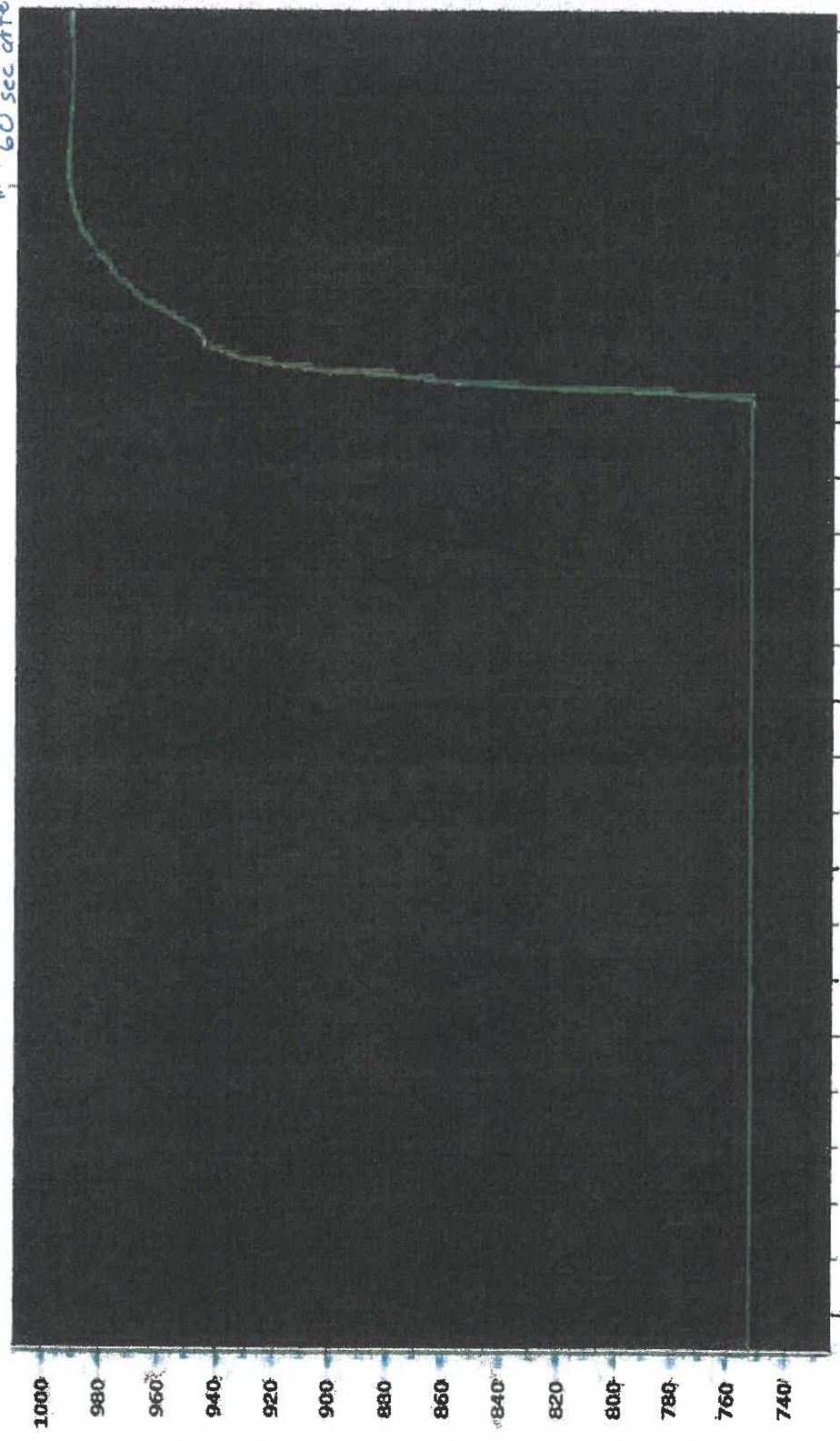
NEW GROUP ▶

GROUP: TEMGRP01

DESCR:

Page 1 of 1

60 sec after ICRLP TRIP



PT0484

PT0494

SG B OUTLET PRESSURE CHAN 2

SG C OUTLET PRESSURE CHAN 2

990.4 PSIG

990.3 PSIG

11:16:25.20

11:17:27.80

ALARM

SCHPZ

AMF

CURRENT FUNCTION: T2

FNP Simulator

28-JUN-2019 11:27:58

NEW DISPLAY ▶

GROUP: TEMGRP01

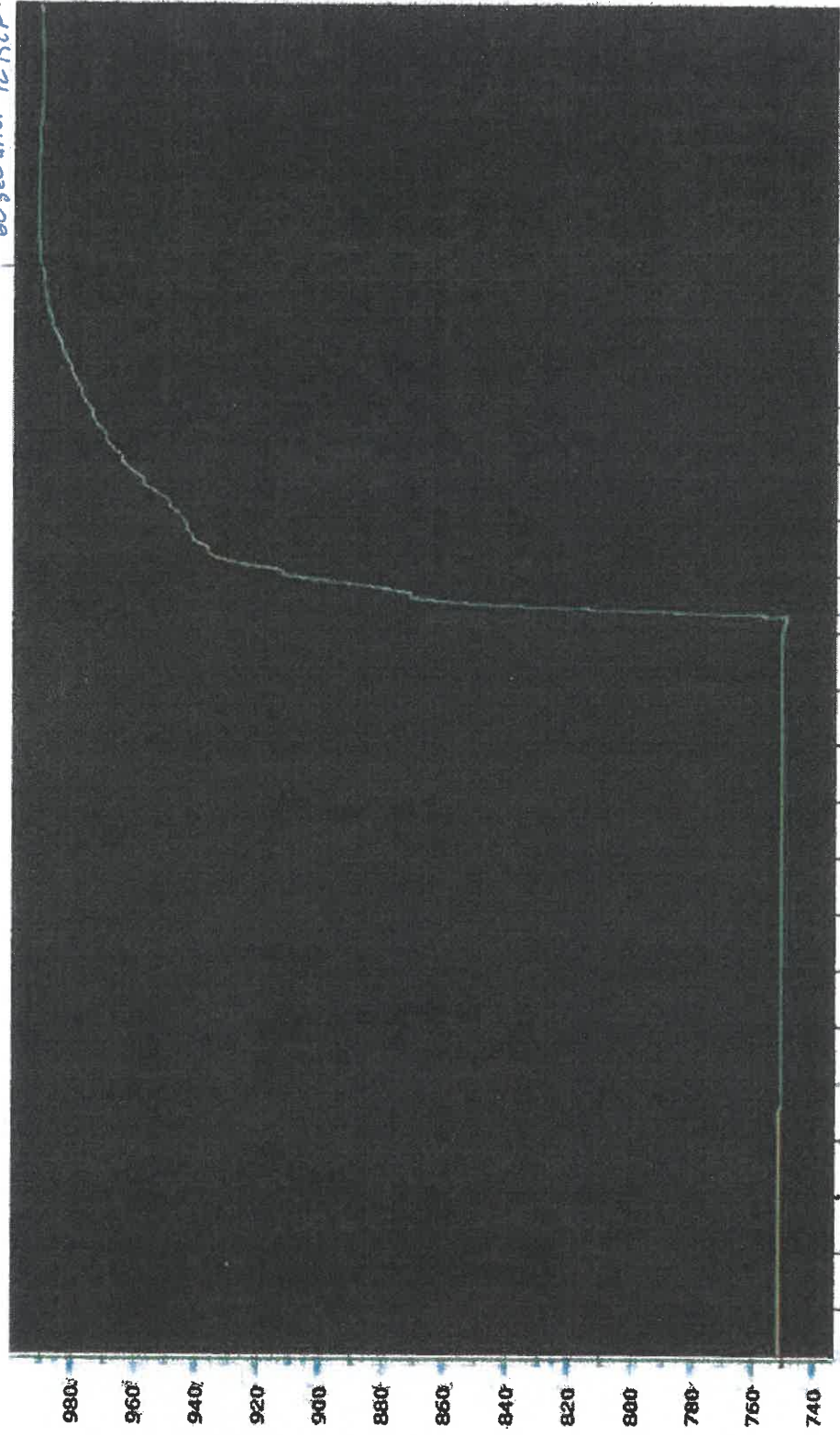
NEW GROUP ▶

DESCR

Page 1 of 1

11:27:26

60 sec after 1C RCP TRIP



PT0484

PT0494

SG B OUTLET PRESSURE CHAN 2

SG C OUTLET PRESSURE CHAN 2

PSIG

PSIG

11:25:03.34

11:25:40.84

11:26:18.34

11:26:55.84

11:27:33.34

TRIP

1C

RCP

2019 Farley NRC Written Exam

QUESTION #61

Unit 1 is at 100% power when the following is observed:

At 1000: the following conditions are observed:

Containment Pressure is (-)0.5 PSIG

Containment Average Air Temperature is (+)101°F

At 2200: The following conditions are observed:

Containment Pressure is (+)1.5 PSIG

Containment Average Air Temperature is (+)110°F

Which of the following completes the statement below **assuming the given trends will continue?**

If no operator actions are taken, __ (1) __ would be the first parameter to require entry into a REQUIRED ACTION statement.

At 2200 Operators are required to __ (2) __ to address the parameter chosen above.

- A. Containment pressure / Start Containment mini-purge
- B. Containment pressure / Vent Containment
- C. Containment temperature / Start Containment Dome recirc fan on fast speed
- D. Containment temperature / Open the containment cooler emergency SW valves

Answer is KEYED for (B)

Recommendations: Recommend deleting this question from the exam due to no correct answer being provided. Part two of this question is invalid because there is no procedural guidance that can be implemented at time **2200**. No FNP procedure exists to vent containment in Modes 1-4 if greater than 1psig and less than 2psig.

Basis:

1. The second part of this question places the examinee at a point where no TS values have been exceeded.
2. Question asks what actions are REQUIRED **at 2200**. At this time, for the operating team to stay within SOP guidance, the pressure rise should be addressed by implementing SOP-12.2. Because pressure is greater than 0.4psid, SOP-12.2 will direct the operator to SOP-10 for POST LOCA VENTING, Attachment 1. SOP-10, Attachment 1, will direct the operator to commence venting prior to 1.0psig. Conditions at 2200 are 1.5psig, so the guidance in the SOP will not allow you to commence venting. At time 2200, we are outside of procedure and the operator would be required to take a time out and involve Operations Management to proceed.
3. Precaution and Limitation of SOP -10, Attachment 1, requires the vent to be commenced if pressure is less than 1psig.
4. At time 2200 pressure has reached 1.5psig, this places the operator outside of procedure for venting containment in Modes 1-4 if pressure is greater than 1psig and less than 2psig.

BANK VERSION

Examination Outline Cross-Reference	Level	RO
103 A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the containment system controls including: Containment pressure, temperature, and humidity	Tier #	2
	Group #	1
	K/A #	103 A1.01
	Rating	3.7

Question 28 (55)

GIVEN:

- Unit 1 is at full power.
- Over the last 12 hours, Containment temperature has risen from 104°F to 105°F and Containment pressure has risen from 0.8 to 1.1 psig
- Both parameters are continuing to rise slowly at the same rate
- Radiation levels are normal

Which containment parameter needs to be addressed first to prevent exceeding a Technical Specification limit and what should be done to address that parameter?

- A. Containment pressure; vent containment
- B. Containment temperature; start an additional CFCU, only
- C. Containment pressure; place containment purge in service
- D. Containment temperature; start all available CFCU's and another CRDM fan

Proposed Answer: A. Containment pressure; vent containment

Explanation:

- A. Correct. Tech Spec limit for temperature is 120F, pressure limit is 1.2 psig. The pressure is the parameter closest to its limit. The action is to consider venting.
- B. Incorrect. Pressure is the parameter closer to its limit. This is the correct action for high temperature.
- C. Incorrect. Pressure is the correct parameter, however, containment purge is not used at power.
- D. Incorrect. Temperature is not the correct parameter, also, there are normally 2 already running and starting 3 CRDM fans is not allowed

Technical References: Tech Spec LCO 3.6.4, 3.6.4, PK01-16, OP H-4:I

References to be provided to applicants during exam: none

Learning Objective: 9697F - .

Question Source:

(note changes; attach parent)

Bank #

Modified Bank #

New

X

Question History:

Last NRC Exam

No

Question Cognitive Level:

Memory/Fundamental

Comprehensive/Analysis

X

10CFR Part 55 Content:

55.41.10

Note: modified D from "all" to "another"

Containment Purge and Pre-access Filtration System	FNP-1-SOP-12.2	
	FARLEY	Version 62.0
	Unit 1	Page 4 of 37
<p>1.0 PURPOSE</p> <p>1. This procedure provides the Initial Conditions, Precautions, Limitations and Instructions for operation of the Containment Purge and Pre-Access Filtration System.</p> <p>2.0 PRECAUTION AND LIMITATIONS</p> <p>1. The following rules apply to operation of the Auxiliary Building Main Exhaust system, in relation to operation of CTMT Purge system:</p> <ul style="list-style-type: none"> a. Both Auxiliary Building Main Exhaust fans must be and should only be placed in service when CTMT main purge is placed in service to prevent an overpressure condition or excessive vacuum from being developed inside the main exhaust plenum. (NEL 99-0078)(REA 98 1808) b. There is one exception to this rule: <u>WHEN</u> the Spent Fuel Pool Ventilation system is NOT operating, and the CTMT Main Purge system is in operation in Lo-Speed, <u>THEN</u> only ONE main exhaust fan is required. (NEL 99-0078) c. For the normal situation where both the Spent Fuel Pool Ventilation fans and the Radwaste Ventilation system fans are running, both Auxiliary Building Main Exhaust fans shall be in operation to operate CTMT Main Purge system. <p>2. A gaseous waste release permit must be obtained prior to purge or mini-purge of CTMT.</p>		
<p style="text-align: center;">NOTE</p> <p>FNP-1-UOP-1.1 and FNP-1-UOP-2.2 control the associated links as necessary to inhibit CTMT Main Purge damper operation when RCS temperature is > 200°F.</p>		
<ul style="list-style-type: none"> 3. CTMT main purge system can only be used when RCS temperature < 200°F. 4. Evaluation, on a case-by-case basis, may be necessary for the release of smoke <u>OR</u> other chemicals, not considered VOCs, that could contaminate the charcoal absorbers <u>OR</u> HEPA filter. 5. Main and mini-purge supply and exhaust dampers must NOT be opened with CTMT pressure greater than 0.4 psid. 6. Mini-purge supply and exhaust fans shall <u>NOT</u> be started with CTMT pressure greater than 0.25 psid. 7. If unable to commence a batch release of CTMT per Attachment 3 prior to exceeding 0.4 psid, FNP-1-SOP-10.0 Attachment 1 may be used for instructions for venting CTMT. 8. Following CTMT ILRT, CTMT purge must be verified vented prior to being placed in service. (AI 2009207430) 9. CR 10268591 has been submitted to evaluate this procedure for PCTCCs. 		

1.0 PURPOSE

This procedure provides the Initial Conditions, Precautions, Limitations and Instructions for operation of the Post LOCA Containment Pressurization and Vent System.

2.0 PRECAUTION AND LIMITATIONS

1. All keylock switches located on the balance of plant panel must be closed with keys removed when the system is not in operation. ☐
2. Containment venting must be performed in accordance with the Health Physics Supervisor's recommendations. ☐
3. Heat tracing circuits on an operable Post Accident Hydrogen Analyzer should remain in service. Low temperatures or moisture could affect analyzer sample results. (IR 2-95-130) ☐

3.0 INITIAL CONDITIONS

1. Post LOCA Containment Pressurization and Vent System valves and Electrical Distribution Systems aligned as required per system check list FNP-1-SOP-10.0A with exceptions noted. ☐
2. Compressed Air System in service and aligned as required for normal operation per FNP-1-SOP-31.0, Compressed Air System. ☐
3. Containment hydrogen concentration has been determined every 24 hours since accident. ☐
4. Minimum of 3 containment cooling units are operating. ☐
5. All available Post Accident Containment Mixing Fans are operating. ☐
6. All available Containment Dome Recirculation Fans are operating. ☐
7. Plant vent stack radiation monitor R-29B (R-29E, F, G and Composite) aligned as required for normal operation per FNP-1-SOP-45.0, Radiation Monitoring System. ☐
8. Performance of Attachment 1 is directed solely by FNP-1-SOP-12.2, Containment Purge And Pre Access Filtration System. ☐

**VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT
PURGE IS SECURED**

Performed by: _____ / _____ Date _____
Print/Signature

Reviewed by: _____ / _____ Date _____
Print/Signature

**VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT
PURGE IS SECURED****1.0 PURPOSE**

- Provide guidance for reducing CTMT pressure to enable starting Mini Purge.
- Provide a method for maintaining CTMT pressure within limits during extended Mini Purge outages.

2.0 PRECAUTIONS AND LIMITATIONS

If in Modes 1 - 4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig.

3.0 INITIAL CONDITIONS

1. The version of this procedure has been **verified** to be the current version.
(OR 1-98-498) _____
2. This procedure has been **verified** to be the correct unit for the task.
(OR 1-98-498) _____
3. If in Modes 1 – 4, performance of this appendix is required by one of the following:
 - To *maintain* containment pressure within limits during extended minipurge outage. _____
 - To *lower* containment pressure to within limits to allow restart of containment minipurge. _____
 - Operations Manager OR designee (Operations Duty Manager) permission to perform this appendix has been obtained. _____
4. Provide Shift Radio Chemist with request for Batch Release permit at least 12 - 24 hours in advance of determined time batch release will take place. _____

Post LOCA Containment Pressurization and Vent System	FNP-1-SOP-10.0	
	FARLEY	Version 42.1
	UNIT 1	Page 21 of 24

ATTACHMENT 1
 Page 3 of 6

VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT PURGE IS SECURED

3.0 INITIAL CONDITIONS (continued)

5. **Use** computer point PC1501 NARROW RANGE CTMT AVG PRESS (preferred) OR the average of the following computer points for monitoring CTMT pressure. _____
 - PT0951
 - PT0952
 - PT0953

6. **Verify** auxiliary building main exhaust system in service per FNP-1-SOP-58.0, Auxiliary Building HVAC System. _____

7. **Verify** ONE of the following is satisfied: **(CR 679389)**
 - a. R-29B (Composite) is in service and aligned as required for normal operation per FNP-1-SOP-45.0, Radiation Monitoring System.

 - AND

 - R-29C in service and aligned as required per FNP-1-SOP-45.0, Radiation Monitoring System. _____

 - b. IF R-29C and/or R-29B (Composite) inoperable, alternate sampling is being performed as required per ODCM. _____

8. **Verify** items listed below are in operation for OPERABLE radiation monitors:
 - Recorder RR0100 (point R-29H and/or R-29B, Composite) _____
 - IPC points for R-29B Vent Composite Gas and/or R-29H Vent Particulate. _____

**VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT
PURGE IS SECURED****4.0 INSTRUCTIONS****NOTES**

- An Administrative LCO is required to be established to control the status of Q1E23MOV3530 and Q1E23MOV3740. These valves are both powered from "B" Train power. If in Modes 1 - 4 AND "B" Train LOSP occurs, Technical Specification 3.6.3 Condition "B" should be applied. ☐
- During an Attachment 1 venting of containment, FT/FQI 3533 data is not required for the batch release permit. ☐

1. IF desired to record containment total flow during the venting operation, THEN **reset** CTMT POST ACCIDENT VENT FLOW TOTALIZER N1E23FQI3533 to zero (000000). _____
2. IF in Modes 1 - 4, THEN **perform** the following: _____
 - a. **Station** an operator locally at CTMT POST ACCIDENT VENT ISO Q1E23MOV3740. _____
 - b. The individual stationed at CTMT POST ACCIDENT VENT ISO Q1E23MOV3740 will be in **continuous** communication with the Control Room. _____

NOTE

The following step is to meet intent of TS Bases to 'rapidly isolate' containment flowpath when required. (TE 875872, CR 10010076) ☐

- c. Individual stationed at CTMT POST ACCIDENT VENT ISO Q1E23MOV3740, will **understand** the responsibility to ensure Q1E23MOV3740 is rapidly isolated when directed, should the need for containment isolation be indicated. (Ref Tech Spec 3.6.3 Bases) _____
3. **Open** CTMT POST ACCIDENT VENT ISO Q1E23MOV3530. (BOP key operated switch) _____
4. **Open** CTMT POST ACCIDENT VENT ISO Q1E23MOV3740. (BOP key operated switch) _____

NOTES

- Pressure control valve Q1E23PCV3532 (Q1E23V033) will automatically regulate vent header pressure at 1 psig during venting operations. ☐
- PI-3742 may be used to verify proper operation of Q1E23PCV3532. (Located on exterior of VCT valve room wall, 121' Radside) ☐

5. **Open** CTMT POST LOCA VENT Q1E23FV3556. _____

Post LOCA Containment Pressurization and Vent System	FNP-1-SOP-10.0	
	FARLEY	Version 42.1
	UNIT 1	Page 23 of 24

ATTACHMENT 1
 Page 5 of 6

**VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT
PURGE IS SECURED**

4.0 INSTRUCTIONS (continued)

6. IF flow is NOT established as indicated by:
 A containment pressure *reduction* on any of the following indications:

- IPC Computer point PC1501, NARROW RANGE CTMT AVG PRESS (preferred)
- IPC Computer point PDT3317, CTMT TO ATMOSPHERE DIFF PRESSURE
- The average of the following computer points for CTMT pressure.
 - PT0951, CTMT PRESSURE CHAN 2
 - PT0952, CTMT PRESSURE CHAN 3
 - PT0953, CTMT PRESSURE CHAN 4

OR

- By flow indication on any of the following indications:
 - PACV OUTLET BOP FLOW INDICATOR, N1E23FI3533A
 - PACV OUTLET LOCAL FI, N1E23FI3533B
 - PACV OUTLET TOTALIZER, N1E23FQI3533

THEN close CTMT POST LOCA VENT Q1E23FV3556. (BOP)

7. **Record** start time/date data in Part III of the Batch Gaseous Waste Release Permit.

8. **Observe** R-29B - Vent Composite Gas and R-29H - Vent Particulate to ensure alarm setpoints NOT exceeded.

9. IF it appears that the vent flow rate will result in *exceeding* any monitor alarm setpoint, THEN **throttle** closed CTMT POST LOCA VENT Q1E23FV3556, as required to reduce vent flow rate. (BOP)

**VENTING CONTAINMENT TO REDUCE CONTAINMENT PRESSURE WHEN CONTAINMENT
PURGE IS SECURED****4.0 INSTRUCTIONS (continued)**

10. WHEN either of the following occurs:

- The required volume of gas has been vented as indicated by containment pressure equalizing with atmospheric pressure OR vent flow is zero
- It is desired to stop the venting.

THEN **close** CTMT POST LOCA VENT Q1E23FV3556. (BOP)
(CR2010100610)

11. **Close** AND **remove** keys for the following valves: (BOP key operated switches)

- a. CTMT POST ACCIDENT VENT ISO Q1E23MOV3740.
- b. CTMT POST ACCIDENT VENT ISO Q1E23MOV3530.

12. **Check** CTMT POST ACCIDENT VENT FLOW N1E23FI3533A or B at zero flow.

13. Record the following data in Part III of the Batch Gaseous Waste Release Permit.

- Final pressure as indicated by computer point PC1501, NARROW RANGE CTMT AVG PRESS.
- Release stop time/date data.

14. **Independently verify** the following valves are CLOSED with keys removed: (BOP key operated switches)

- a. CTMT POST ACCIDENT VENT ISO Q1E23MOV3740.
- b. CTMT POST ACCIDENT VENT ISO Q1E23MOV3530.

15. **Independently verify** CTMT POST LOCA VENT Q1E23FV3556 set to zero demand.

16. **Ensure** the Batch Gaseous Waste Release Permit is reviewed by a member of OPS supervision.

IV

IV

IV

Southern Nuclear Operating

To: Michael Meeks, Senior Operations Engineer
From: Reed, Brian
CC: Recipient names
Date: 7/17/2019
Re: NRC Written Exam Question Student Challenges

-
1. Question 2- The facility agrees with the student's recommendation to remove question 2 from the exam due to no correct answer available. The question asks what is happening to the SG Pressure 60 Seconds after the transient. While the pressure was greater at one minute than at the start, the pressure at 60 seconds has stabilized. There is no choice for a stable pressure therefore there is no correct answer.
 2. Question 61 – The facility agrees with the student's recommendation to remove question 61 from the exam due to no correct answer available. The first part of the question has a correct answer. The second portion of the question does not have an answer consistent with station policies. The question would drive the student to assess the proper actions to take at 2200. Containment pressure is 1.5 psig which is above normal operating value. An operator would use SOP-12.2 to lower pressure. SOP-12.2 would direct the operator to SOP-10, Attachment 1. The Precaution and limitation at the beginning of attachment 1 says, "If in Modes 1-4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig". The expectations for our operators for precautions and limitations not met is to stop and get the larger Farley team engaged in the decision on how to move forward. Since in this case they did not meet the precautions and limitations, the correct action is to stop and allow the team to weigh in on the actions to move forward. This is not an option for the answer on the second portion of the question therefore there is no correct answer.