REQUEST TO CHANGE PROCEDURE ADM-5.4 Attachment 3 NORTH ANNA POWER STATION Page 1 of 1 VIRGINIA POWER 07-09-87 1. JUPERVISOR RESPONSIBLE FOR FOLLOWING PROCEDURE: OPERATING ABNORMAL CURVE BOOK WELDING EMERGENCY S PERIODIC TEST ADMINISTRATIVE □ IN-SERVICE INSPECTION HEALTH PHYSICS ANNUNCIATOR SPECIAL TEST MAINTENANCE CALIBRATION NON-DESTRUCTIVE TEST START-UP TEST CHEMISTRY 2 UNIT NO: 3 REVISION DATE: PROCEDURE NO: 1-PT-46.2 TITLE: Primary-to- Secondary Lank Rate Determination CHANGES REQUESTED: (GIVE STEP NUMBER, EXACT SUGGESTED WORDING, AND LIST REFERENCES, STAPLE COPY OF PROCEDURE WITH SUGGESTED CHANGES MARKED TO THIS FORM.) Redere entire procedures with attached REFERENCES : Latter to NRC, 9/15/37 Ser. No. 87-474A REASON FOR CHANGES: To odd supportence of St- Blowslown Rediction menitors and to odd supportence of the epplicability of the elern setpents GE REQUESTED BY: 8 DATE: 10/1/27 ACTION TAKEN: DOES THIS CHANGE THE OPERATING METHODS AS DESCRIBED IN THE UFSARV TYES NO NO DOES THIS CHANGE INVOLVE A CHANGE TO THE TECH. SPECSY T YES X NO DOES THIS CHANGE INVOLVE A POSSIBLE UNREVIEWED SAFETY QUESTION T YES 64 NO IF ALL "NO", NO "SAFETY ANALYSIS" IS REQUIRED. IF ANY "YES", A "SAFETY ANALYSIS" IS REQUIRED. (10CFR50.59) APPROVED COPY TO BE PROVIDED TO LICENSING COORD. FOR INCLUSION IN ANNUAL REPORT. RECOMMENDED ACTION: APPROVED. C DISAPPROVED DOES THIS PROCEDURE CREATE A QA DOCUMENT YES NO-BY: (COGNIZANT SUPERVISOR) DATE: 10/2/8 REVIEWED BY QUALITY ASSURANCE: CHANGES MADE: YES NO P 14 BY: ROVIDH PORCHEROD 15 DATE CURSORA 16 Quan 10-02-37 REVIEWED BY STATION NUCLEAR SAFETY AND OPERATING COMMITTEE: APPROVED DISAPPROVED APPROVED AS MODIFIED BY COMMITTEE RMAN SIGNATURE: DATE: 18 19 19/2/87 NEW PROCEDURE REVISION DATE: 7203030462 910819 PDR E0162 910819 PDR FCIA WILLIAM91-106 PDR 21 ACTION COMPLETED BY: DATE:

# PERIODIC TEST CRITIQUE NORTH ANNA POWER STATION VIRGINIA POWER

Periodic Test No: 1 To be Performed By: 1-PT-46.2 SHIFT TECHNICAL ADVISOR	2 Unit No: 3 1
Test Title: PRIMARY-TO-SECONDARY LEAK RATE DETERMINATION	
Test Frequency: DAILY	5
Unit Conditions Requiring Test: MODE 1	6
Test Performed By: 00:00 - 04:00: 04:00 - 08:00: 08:00 - 12:00: 12:00 - 16:00: 16:00 - 20:00: 20:00 - 24:00:	Test Date:
Test Results (To be completed by performer of test Supervisor(s)):	and Cognizant 9
<ol> <li>/</li></ol>	/7 Partial Procedure back of sheet for additional
4. Work Order No.:	Dated:
Forward To Cognizant St	Ipervisor
Test Reviewed and Approved By Cognizant Supervisor( Date:	(s) or Designee: 10 Date:
SUPV. SURV.	& TEST
Forward To Performance	Engineer
Comment(s) of Performance Engineer: 11	Stamp: 12

1-PT-46.2 Page 1 of 29 00-00-00

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PERIODIC TEST PROCEDURE FOR NORTH ANNA POWER STATION UNIT NO.: 1

TITLE: Primary-to-Secondary Leak Rate Determination

**REFERENCES**:

- 1. Calculational Basis for PT-46.2, approved 9/15/87.
- 2. Technical Specification 3.4.6.2.c.
- 3. CAP-4.0, "Primary-to-Secondary Leak Rate Calculation." (See Rev. 0)
- Letter from W. L. Stewart to the NRC, "North Anna Power Station Unit 1 Steam Generator Tube Rupture Event Report - Rev. 1," Ser. No. 87-474A.
- 5. 1-PT-46.2A, "Condensor Air Ejector Radiation Alarm Setpoint Calculation."
- 6. 1-FT-46.2B, "N-16 Radiation Alarm Setpoint Calculation."
- 7. 1-PT-46.2C, "S/G Blowdown Radiation Alarm Setpoint Calculation."
- 8. Operations Department Standing Order Number 155.

REVISION	RECORD:			APPROVED
REV.	NO.	PAGE(S)	DATE	CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE

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APPROVED BY:

CHAIRMAN STATION NUCLEAR SAFETY AND OPERATING COMMITTEE

DATE:

SUPERINTENDENT TECHNICAL SERVICES

1-PT-46.2 Page 2 of 29 00-00-00

#### Initials

#### 1.0 Purpose

1.1 To determine the primary-to-secondary leak rate once every 24 hours. and to evaluate the radiation monitors and air ejector grab sample isotopic trends.

#### 2.0 Initial Conditions

2.1 The unit is critical.

NOTE: If this is an initial startup, then previous PTs may not be available.

2.2 The data from the previous two 1-PT-46.2 procedures are available.

#### 3.0 Precautions and Limitations

- 3.1 The following data must be collected and trended according to the following surveillance intervals:
  - a) N-16 Radiation Monitor 4 hours
  - b) 1-RM-SV-121 (Air Ejector) 4 hours
  - c) S/G Blowdown Radiation Monitors 4 hours
  - d) Air Ejector Grab Samples 8 hours
  - e) S/G leak rates (CAP 4.0) 24 hours
  - f) RCS isotopic samples 24 hours
- 3.2 This procedure is performed once every 24 hours. However, portions of this procedure bust be completed in accordance with the above surveillance requirements, so the following steps must be performed during the following time intervals:

Step 4.1: 00:00 to 04:00

Step 4.2: 04:00 to 08:00

1-PT-46.2 Page 3 of 29 00-00-00

Step 4.3: 08:00 to 12:00 Step 4.4: 12:00 to 16:00 Step 4.5: 16:00 to 20:00 Step 4.6: 20:00 to 24:00

- 3.3 The individual minor steps may be performed out of sequence, as long as all the major steps are performed within their required surveillance periods.
- 3.4 If any of the leak rate determination methods identified in Step 3.1 are not available, mark and initial the appropriate steps "N/A" and initiate a Work Request (ADM 16.5). Record the Work Request number on the Critique Sheet. Immediately notify the Shift Supervisor to review Standing Order Number 155 for any required actions.
- 3.5 Use Attachment 6.10 as guidance to estimate the RCS isotopic values.
- 3.6 If the power history is sufficiently unstable to estimate the primary isotopics, then request a RCS isotopic analysis.
- 3.7 If Attachments 6.7, 6.8 and 6.9 demonstrate conflicting trends, or if data is questionable, immediately notify the Shift Supervisor and contact Chemistry to perform a leak rate calculation (CAP-4.0).
- 3.8 If the total primary-to-secondary leak rate demonstrates a 60 gpd increase between surveillance intervals, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.

1-PT-46,2 Page 4 of 29 00-00-00

- 3.9 Evaluate the trend in the leak rate to determine the time at which the individual leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 3.10 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant</u> <u>shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 3.11 Condenser Air Ejector flow rate is measured once per eight hour shift by 1-LOG-6.C. Unless leak rates are rapidly increasing, use this data to complete Attachments 6.1 through 6.6.
- 3.12 Samples/count rates should be taken/recorded at approximately the same time to better ensure compatibility of leak rate comparisons.
- 3.13 The Condenser Air Ejector radiation monitor (1-RM-SV-121) "High" alarm limit shall be set to less than or equal to 20 gpd above the current leak rate.
- 3.14 The N-16 radiation monitor "First" alarm setpoint shall be set to less than or equal to 20 gpd above the current leak rate. The N-16 radiation monitor "second" alarm setpoint shall be set to less than or equal to 60 gpd above the current leak rate, or 100 gpd, whichever is more restrictive.
- 3.15 The S/G blowdown radiation monitors (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) shall be set to less than 4 times the current count rate.

1-PT-46.2 Page 5 of 29 00-00-00

4.0 Instructions

STEP 4.1

NOTE: The following must be performed between 00:00 and 04:00.

- 4.1.1 Plot the data from the two previous 1-PT-46.2 procedures (if available
  see Step 2.2) on Attachments 6.7, 6.8 and 6.9.
- 4.1.2 Record the power level and condenser air ejector flow rate on Attachment 6.7.
- 4.1.3 Collect the LC is topics from chemistry and record on Attachment 6.1
- 4.1.4 Collect the S/G leak rates from chemistry and record on Attachment 6.1
- 4.1.5 Record the N-16 radiation monitor leak rate and location on Attachment 6.1.
- 4.1.6 Record the count rate from 1-RM-SV-121 (Air Ejector Radiation Monitor) on Attachment 6.1.
- 4.1.7 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.1.
- 4.1.8 Collect the Condenser Air Ejector Grab Samples from Health Physics, and record on Atta Lument 6.1
- 4.1.9 Calculate and record the S/G cotal leak rate based on the grab samples, and record on Attachment 6.1.
- 4.1.10 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.1.
- 4.1.11 Plot the individual S/G leak rates from Step 4.1.4 on Attachment 6.7.
- 4.1.12 Plot the total S/G leak rate from 4.1.4, 4.1.5, 4.1.7, and 4.1.9 on Attachment 6.8.
- 4.1.13 Plot the radiation monitor count rates from 4.1.6 and 4.1.10 on Attachment 6.9.

8

1-PT-46.2 Page 6 of 29 00-00-00

- 4.1.14 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using core 4.1.
- 4.1.15 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> <u>be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.1.16 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> <u>in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.1.17 Compare the leak rate from 4.1.7 to the leak rate that corresponds to the "High" alarm setpoint of 1-RM-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.1.7), immediately initiate 1-PT-46.2A.
- 4.1.18 Compare the leak rate from 4.1.5 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.1.5), immediately initiate 1-PT-46.2B.
- 4.1.19 Compare the leak rate from 4.1.5 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.1.5), or more than 100 gpd, immediately initiate 1-PT-46.2B.

1-PT-46.2 Page 7 of 29 00-00-00

- 4.1.20 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.1.10, immediately initiate 1-PT-46.2C.
- 5.1 Acceptance Criteria (for Step 4.1 only)

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<u>CAUTION:</u> If Acceptance Criteria 5.1.1 or 5.1.2 can not be met, <u>initiate</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

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5.1.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.

5.1.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

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<u>CAUTION:</u> If Acceptance Criteria 5.1.3 can not be met, immediately notify the Shift Supervisor to <u>reduce power to less than or</u> <u>equal to 50% as soon as possible, but within 90 minutes.</u>

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5.1.3 The trends from Attachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 8 of 29 00-00-00

- 5.1.4 Ensure that the High Alarm setpoint to 1-RM-SV-121 is less than 20 gpd above the leak rate calculated by 4.1.7, or initiate 1-PT-46.2A.
- 5.1.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.1.5 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.1.5, or initiate 1-FT-46.2B.

5.1.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current count rates, or initiate 1-PT-46.2C.

5.1.7 Any actions required by Operations Department Standing Order Number 155 have been evaluated by the Shift Supervisor.

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1-1-46.2 Page 9 of 29 00-00-00

STEP 4.2

NOTE: The following must be performed between 04:00 and 08:00.

- 4.2.1 Review the Initial Conditions (Step 2.0) and the Precautions and Limitations (Step 3.0) to this procedure.
- 4.2.2 Record the power level and condenser air ejector flow rate on Attachment 6.2.
- 4.2.3 Estimate the RCS isotopics from chemistry and record on Attachment 6.2.
- 4.2.4 Record the N-16 radiation monitor leak rate and location on Attachment 6.2.
- 4.2.5 Record the count rate from 1-RM-SV-121 (Air Ejector Radiation Monitor) on Attachment 6.2.
- 4.2.6 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.2.
- 4.2.7 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.2.
- 4.2.8 Plot the total S/G leak rate from 4.2.4 and 4.2.6 on Attachment 6.8.
- 4.2.9 Plot the radiation monitor count rates from 4.2.5 and 4.2.7 on Attachment 6.9.
- 4.2.10 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.

1-PT-46.2 Page 10 of 29 00-00-00

- 4.2.11 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> <u>be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.2.12 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> <u>in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.2.13 Compare the leak rate from 4.2.6 to the leak rate that corresponds to the "High" alarm setpoint of 1-RM-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.2.6), immediately initiate 1-PT-46.2A.
- 4.2.14 Compare the leak rate from 4.2.4 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.2.4), immediately initiate 1-PT-46.2B.
- 4.2.15 Compare the leak rate from 4.2.4 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.2.4), or more than 100 gpd, immediately initiate 1-PT-46.2B.
- 4.2.16 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.2.7, immediately initiate 1-PT-46.2C.

1-PT-46.2 Page 11 of 29 00-00-00

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#### 5.2 Acceptance Criteria (for Step 4.2 only)

CAUTION: If Acceptance Criteria 5.2.1 or 5.2.2 can not be met, <u>initiate</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

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5.2.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.

5.2.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

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<u>CAUTION:</u> If Acceptance Criteria 5.2.3 can not be met, immediately notify the Shiit Supervisor to <u>reduce power to less than or</u> <u>equal to 50% as soon as possible, but within 90 minutes.</u>

5.2.3 The trends from Attachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 12 of 29 00-00-00

- 5.2.4 Ensure that the High Alarm setpoint to 1-RM-SV-121 is less than 20 gpd above the leak rate calculated by 4.2.6, or initiate 1-PT-46.2A.
- 5.2.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.2.4 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.2.4, or initiate 1-PT-46.2B.
- 5.2.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current coust rates, or initiate 1-PT-46.2C.
- 5.2.7 Any actions required by Operations Department Standing Order Number 155

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have been evaluated by the Shift Supervisor.

1-PT-46.2 Page 13 of 29 00-00-00

STEP 4.3

NOTE: The following must be performed between 08:00 and 12:00.

- 4.3.1 Review the Initial Conditions (Step 2.0) and the Precautions and Limitations (Step 3.0) to this procedure.
- 4.3.2 Record the power level and condenser air ejector flow rats on Attachment 6.3.
- 4.3.3 Estimate the RCS isotopics from chemistry and second on Attachment 6.3.
- 4.3.4 Record the N-16 radiation monitor leak rate and location on Attachment 6.3.
- 4.3.5 Record the count rate from 1-RM-SV-121 (Air Ejector Padiation Monitor) on Attachment 6.3.
- 4.3.6 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.3.
- 4.3.7 Collect the Condenser Air Ejector Grab Samples from Health Physics, and record on Attachment 6.3.
- 4.3.8 Calculate and record the total S/G leak rate based on the grab samples, and record on Attachment 5.3.
- 4.3.9 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.3.
- 4.3.10 Plot the total S/G leak rate from 4.3.4, 4.3.6, and 4.3.8 on Artachment 6.8.
- 4.3.11 Plot the radiation monitor count rates from 4.3.5 and 4.3.9 on Attachment 6.9.

1-PT-46.2 Page 14 of 29 00-00-00

- 4.3.12 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.
- 4.3.13 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> be in mode 3 within 6 hours, and initiate 1-AP-24.1.
- 4.3.14 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> in mode 3 within 6 hours, and initiate 1-AP-24.1.
- 4.3.15 Compare the leak rate from 4.3.6 to the leak rate that corresponds to the "High" alarm setpoint of 1-RM-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.3.6), immediately initiate 1-PT-46.2A.
- 4.3.16 Compare the leak rate from 4.3.4 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.3.4), immediately initiate 1-PT-46.2B.
- 4.3.17 Compare the leak rate from 4.3.4 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.3.4), or more than 100 gpd, immediately initiate 1-PT-46.2B.

1-PT-46.2 Page 15 of 29 00-00-00

4.3.18 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.3.9, immediately initiate 1-PT-46.2C.

### 5.3 Acceptance Criteria (for Step 4.3 only)

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<u>CAUTION:</u> If Acceptance Criteria 5.3.1 or 5.3.2 can not be met, <u>initiate</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

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- 5.3.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.
- 5.3.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

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<u>CAUTION:</u> If Acceptance Criteria 5.3.3 can not be met, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes.

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5.3.3 The trends from ttachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 16 of 2° 00-00-00

- 5.3.4 Ensure that the High Alara setpoint to 1-RM-SV-121 is less than 20 gpd above the lask rate calculated by 4.3.6, or initiate 1-PT-46.2A.
- 5.3.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.3.4 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.3.4, or initiate 1-PT-46.2B.

5.3.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current count rates, or initiate 1-PT-46.2C.

5.3.7 Any actions required by Operations Department Standing Order Number 155

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have been evaluated by the Shift Supervisor.

1-PT-46.2 Page 17 of 29 00-00-00

STEP 4.4

NOTE: The following must be performed between 12:00 and 16:00.

- 4.4.1 Review the Initial Conditions (Step 2.0) and the Precautions and Limitations (Step 3.0) to this procedure.
- 4.4.2 Record the power level and condenser air ejector flow rate on Attachment 6.4.
- 4.4.3 Estimate the RCS isotopics from chemistry and record on Attachment 6.4.
- 4.4.4 Record the N-16 radiation monitor leak rate and location on Attachment 6.4.
- 4.4.5 Record the count rate from 1-RM-SV-121 (Air Ejector Radiation Monitor) on Attachment 6.4.
- 4.4.6 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.4.
- 4.4.7 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.4.
- 4.4.8 Plot the total S/G leak rate from 4.4.4 and 4.4.6 on Attachment 6.8.
- 4.4.9 Plot the radiation monitor count rates from 4.4.5 and 4.4.7 on Attachment 6.9.
- 4.4.10 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.

1-PT-46.2 Page 18 of 29 00-00-00

- 4.4.11 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> <u>be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.4.12 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> <u>in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.4.13 Compare the leak rate from 4.4.6 to the leak rate that corresponds to the "High" alarm setpoint of 1-R.4-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.4.6), immediately initiate 1-PT-46.2A.
- 4.4.14 Compare the leak rate from 4.4.4 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.4.4), immediately initiate 1-PT-46.2B.
- 4.4.15 Compare the leak rate from 4.4.4 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.4.4), or more than 100 gpd, immediately initiate 1-PT-46.2B.
- 4.4.16 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.4.7, immediately initiate 1-PT-46.2C.

1-PT-46.2 Fage 19 of 29 00-00-00

5.4 Acceptance Criteria (for Step 4.4 only)

<u>CAUTION:</u> If Acceptance Criteria 5.4.1 or 5.4.2 can not be met, <u>ini late</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

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5.4.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.

5.4.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

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<u>CAUTION:</u> If Acceptance Criteria 5.4.3 can not be met, immediately notify the Shift Supervisor to <u>reduce power to less than or</u> <u>equal to 50% as soon as possible, but within 90 minutes.</u>

5.4.3 The trends from Attachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 20 of 29 00-00-00

- 5.4.4 Ensure that the High Alarm setpoint to 1-RH-SV-121 is less than 20 gpd above the leak rate calculated by 4.4.6, or initiate 1-PT-46.2A.
- 5.4.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.4.4 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.4.4, or initiate 1-PT-46.2B.

5.4.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current count rates, or initiate 1-PT-46.2C.

5.4.7 Any actions required by Operations Department Standing Order Number 155 have been evaluated by the Shift Supervisor.

S.S.

1-PT-46.2 Page 21 of 29 00-00-00

STEP 4.5

NOTE: The following must be performed between 16:00 and 20:00.

- 4.5.1 Review the Initial Conditions (Step 2.0) and the Precautions and Limitations (Step 3.0) to this procedure.
- 4.5.2 Record the power level and condenser air ejector flow rate on Attachment 6.5.
- 4.5.3 Estimate the RCS isotopics from chemistry and record on Attachment 6.5.
- 4.5.4 Record the N-16 radiation monitor leak rate and location on Attachment 6.5.
- 4.5.5 Record the count rate from 1-RM-SV-121 (Air Ejector Radiation Monitor) on Attachment 6.5.
- 4.5.6 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.5.
- 4.3.7 Collect the Condenser Air Ejector Grab Samples from Health Physics, and record on Attachment 6.5.
- 4.5.8 Calculate and record the total S/G leak rate based on the grab samples, and record on Attachment 6.5.
- 4.5.9 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.5.
- 4.5.10 Plot the total S/G leak rate from 4.5.4, 4.5.6, and 4.5.8 on Attachment 6.8.
- 4.5.11 Plot the radiation monitor count rates from 4.5.5 and 4.5.9 on Attachment 6.9.

1-PT-46.2 Page 22 of 29 00-00-00

- 4.5.12 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.
- 4.5.13 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> be in mode 3 within 6 hours, and initiate 1-AP-24.1.
- 4.5.14 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> in mode 3 within 6 hours, and initiate 1-AP-24.1.
- 4.5.15 Compare the leak rate from 4.5.6 to the leak rate that corresponds to the "High" alarm setpoint of 1-RM-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.5.6), immediately initiate 1-PT-46.2A.
- 4.5.16 Compare the leak rate from 4.5.4 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.5.4), immediately initiate 1-PT-46.2B.
- 4.5.17 Compare the leak rate from 4.5.4 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.5.4), or more than 100 gpd, immediately initiate 1-PT-46.2B.

1-PT-46.2 Page 23 of 29 00-00-00

4.5.18 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.5.9, immediately initiate 1-PT-46.2C.

#### 5.5 Acceptance Criteria (for Step 4.5 only)

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<u>CAUTION:</u> If Acceptance Criteria 5.5.1 or 5.5.2 can not be met, <u>initiate</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

\*\*\*\*\*\*

- 5.5.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.
- 5.5.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

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<u>CAUTION:</u> If Acceptance Criteria 5.5.3 can not be met, immediately notify the Shift Supervisor to <u>reduce power to less than or</u>

equa! to 50% as soon as possible, but within 50 vinutes.

5.5.3 The trends from Attachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 24 of 29 00-00-00

- 5.5.4 Ensure that the High Alarm setpoint to 1-RM-SV-121 is less than 20 gpd above the leak rate calculated by 4.5.6, or initiate 1-PT-46.2A.
- 5.5.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.5.4 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.5.4, or initiate 1-PT-46.2B.
- 5.5.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current count rates, or initiate 1-PT-46.2C.
- 5.5.7 Any actions required by Operations Department Standing Order Number 155 have been evaluated by the Shift Supervisor.

S.S.

1-PT-46.2 Page 25 of 29 00-00-00

#### STEP 4.6

NOTE: The following must be performed between 20:00 and 24:00.

- 4.6.1 Review the Initial Conditions (Step 2.0) and the Precautions and Limitations (Step 3.0) to this procedure.
- 4.6.2 Record the power level and condenser air ejector flow rate on Attachment 6.6.
- 4.6.3 Estimate the RCS isotopics from chemistry and record on Attachment 6.6.
- 4.6.4 Record the N-16 radiation monitor leak rate and location on Attachment 6.6.
- 4.6.5 Record the count rate from 1-RM-SV-121 (Air Ejector Radiation Monitor) on Attachment 6.6.
- 4.6.6 Calculate and record the total leak rate based on 1-RM-SV-121 using the equation from Attachment 6.6.
- 4.6.7 Record the S/G blowdown radiation monitor (1-RM-SS-122, 1-RM-SS-123, and 1-RM-SS-124) count rates on Attachment 6.6.
- 4.6.8 Plot the total S/G leak rate from 4.6.4 and 4.6.6 on Attachment 6.8.
- 4.6.9 Plot the radiation monitor count rates from 4.6.5 and 4.6.7 on Attachment 6.9.
- 4.6.10 Evaluate Attachments 6.7, 6.8, and 6.9 for an increasing trend in S/G leak rate. If either Attachment 6.7 or Attachment 6.8 indicates a step change of 60 gpd or more, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes, and immediately reevaluate the leak rates using step 4.1.

1-PT-46.2 Page 26 of 29 00-00-00

- 4.6.11 Evaluate Attachments 6.7 and 6.8 for the trend in the leak rate to determine the time at which the individual steam generator leak rates will exceed 100 gpd. If Chemistry can not perform CAP-4.0 before the trend would indicate a 100 gpd leak rate, <u>initiate a Plant Shutdown and</u> <u>be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.6.12 If the total primary-to-secondary leak rate exceeds 300 gpd total leak rate, or 100 gpd per steam generator, <u>initiate a plant shutdown and be</u> <u>in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.
- 4.6.13 Compare the leak rate from 4.6.6 to the leak rate that corresponds to the "High" alarm setpoint of 1-RM-SV-121. If the "High" alarm setpoint is more than 20 gpd above the measured leakrate (Step 4.6.6), immediately initiate 1-PT-46.2A.
- 4.6.14 Compare the leak rate from 4.6.4 to the N-16 monitor "First" alarm setpoint. If the "First" alarm setpoint is more than 20 gpd above the measured leak rate (Step 4.6.4), immediately initiate 1-PT-46.2B.
- 4.6.15 Compare the leak rate from 4.6.4 to the N-16 monitor "Second" alarm setpoint. If the "Second" alarm setpoint is more than 60 gpd above the measured leak rate (Step 4.6.4), or more than 100 gpd, immediately initiate 1-FT-46.2B.
- 4.6.16 Compare the S/G blowdown radiation monitor count rates to the "High" alarm setpoints for each S/G. If the "High" alarm setpoint is more than 4 times the count rate from 4.6.7, immediately initiate 1-PT-46.2C.

1-PT-46.2 Page 27 of 29 00-00-00

5.6 Acceptance Criteria (for Step 4.6 only)

<u>CAUTION:</u> If Acceptance Criteria 5.6.1 or 5.6.2 can not be met, <u>initiate</u> <u>a Plant Shutdown and be in mode 3 within 6 hours</u>, and initiate 1-AP-24.1.

\*\*\*\*\*

5.6.1 All individual S/G leak rates are less than 100 gpd, or any more restrictive leak rate limit specified by a Standing Order.

5.6.2 The total S/G leak rate is less than 300 gpd, or any more restrictive leak rate limit specified by a Standing Order.

\*\*\*\*\*

<u>CAUTION:</u> If Acceptance Criteria 5.6.3 can not be met, immediately notify the Shift Supervisor to reduce power to less than or equal to 50% as soon as possible, but within 90 minutes.

5.6.3 The trends from Attachments 6.7 and 6.8 do not demonstrate any significant S/G tube degradation (step changes of greater than 60 gpd between surveillance intervals, or a rapidly increasing leak rate which would exceed any limit prior to the next surveillance interval).

1-PT-46.2 Page 28 of 29 00-00-00

- 5.6.4 Ensure that the High Alarm setpoint to 1-RM-SV-121 is less than 20 gpd above the leak rate calculated by 4.6.6, or initiate 1-PT-46.2A.
- 5.6.5 Ensure that the N-16 "First" alarm setpoint is less than 20 gpd above the leak rate obtained by 4.6.4 and that the N-16 "Second" alarm setpoint is less than 60 gpd (not to exceed a total of 100 gpd) above the leak rate obtained by 4.6.4, or initiate 1-PT-46.2B.
- 5.6.6 Ensure that the S/G blowdown radiation monitor "High" alarm setpoints are less than 4 times the current count rates, or initiate 1-PT-46.2C.
- 5.6.7 Any actions required by Operations Department Standing Order Number 155 have been evaluated by the Shift Supervisor.

S.S.

1-PT-46.2 Page 29 of 29 00-00-00

4.7 Forward the results to the Shift Supervisor for his review.

## 5.0 Acceptance Criteria

5.1 All Acceptance Criteria from steps 4.1 through 4.6 have been met.

6.0 Attachments

6.1 S/G Leak Rates (00:00 - 04:00)

6.2 S/G Leak Rates (04:00 - 08:00)

6.3 S/G Leak Rates (08:00 - 12:00)

6.4 S/G Leak Rates (12:00 - 16:00)

6.5 S/G Leak Rates (16:00 - 20:00)

6.6 S/G Leak Rates (20:00 - 24:00)

6.7 Individual S/G Leak Rate Trend

6.8 Total 3/G Leak Rate Trend

6.9 Radiation Monitor Count Rate Trend

6.10 Guidance for Estimating RCS Isotopic Activities

	1-PT-46.2 Attachment 6.1 Page 1 of 1 00-00-00
Date: Time: Power Level: % Air Eje	sctor: SCFM
RCS Isotopics (uCi/gm): Xe-135 Kr-87	Ar-41
RCS Isotopics Measured (Record Sample Time):	or Estimated
CAP-4.0 Leak Rates (gpd): A B	Total
N-16 Radiation Monitor Total Leak Rate (gpd):	Location:
Air Ejector Radiation Monitor Count Rate (1-RM-SV-121):	сре
Calculated Total Leak Rate Based on 1-RM-SV-121*	gpd
Air Ejector Grab Samples (uCi/cm <sup>3</sup> ): Xe-135 Kr-87 Air Ejector Leak Rates Xe-135 Kr-87 Average Total Leak Rate Based on Air Ejector Grab Samples:	Ar-41 Ar-41 gpd
S/G BLOWDOWN RADIATION MONITOR COUNT RATES (cpm) A (1-RM-SS-122): B (1-RM-SS-123): C (1)	1-RM-SS-124):
* Leak Rate (gpd) = (2.92 x 10 <sup>-4</sup> )(Air Ejector Flow)(1-RM-SV-121) (Xe-135 + Kr-87 + Ar-41)	
** Leak Rate (gpd) = (Grab Sample Activity)(Air Ejector Flow)(1.08 (RCS Activity)	<u>8 x 10<sup>4</sup>)</u>
Prepared By: Date: Ti	ime:

1-PT-46.2 Attachment 6.2 Page 1 of 1 00-00-00

# S/G LEAK RATES (04:00 - 08:00) Date: Time: Power Level: % Air Ejector: SCFM

RCS Isotopics (uCi/gm): Xe-135	Kr-87 Ar-41
RCS Isotopics Measured (Record Sample Time):	or Estimated
N=16 Radiation Monitor Total Leak Rate (gpd):	LOCATION:
Air Ejector Radiation Monitor Count Rate (1-R	M-SV-121): cpm
Calculated Total Leak Rate Based on 1-RM-SV-1	21 <sup>#</sup> gpd
S/G BLOWDOWN RADIATION MONITOR COUNT RATES (c A (1-RM-SS-122): B (1-RM-SS-123)	pm) : C (1-RM-SS-124): _

Prepared By: \_\_\_\_\_ Date: \_\_\_\_ Time: \_\_\_\_\_

1-PT-46.2 Attachment 6.3 Page 1 of 1 00-00-00 S/G LEAK RATES (08:00 - 12:00) Date: Time: Power Level: % Air Ejector: SCFM RCS Isotopics (uCi/gm): Xe-135 Kr-87 Ar-41 RCS Isotopics Messured (Record Sample Time): \_\_\_\_\_ or Estimated \_\_\_\_\_ N-16 Radiation Monitor Total Leak Rate (gpd): \_\_\_\_\_ LOCATION: Air Ejector Radiation Monitor Count Rate (1-RM-SV-121): cpm Calculated Total Leak Rate Based on 1-RM-SV-121 gpd Air Ejector Grab Samples (uCi/cm<sup>s</sup>): Xe-135 Kr-87 Ar-41 Air Ejector Leak Rates Xe-135 Kr-87 Ar-41 Average Total Leak Rate Based on Air Ejector Grab Samples: gpd S/G BLOWDOWN RADIATION MONITOR COUNT RATES (CDB) A (1-RM-SS-122): B (1-RM-SS-123): C (1-RM-SS-124): \* Leak Rate (gpd) = (2.92 x 10<sup>-4</sup>)(Air Ejector Flow)(1-RM-SV-121) (Xe-135 + Kr-87 + Ar-41) "Leak Rate (gpd) = (Grab Sample Activity)(Air Ejector Flow)(1.08 x 10<sup>4</sup>) (RCS Activity) Prepared By: \_\_\_\_\_ Date: Time:

1-PT-46.2 Attachment 6.4 Page 1 ci 1

		S/G LEAK RATES	(12:00 - 16:	00-00	-00
Date:	Time:	P' or Level:	<u> </u>	Air Ejector:	SCFM
RCS Isotopics	(uCi/gm): Xe-1	35	<u>Kr-87</u>	Ar-41	
RCS Isotopics	Measured (Recor	rd Sample Time):	s install and a second seco	or Estimate	d
N-16 Radiatio	on Monitor Total	Leak Rate (gpd)	I	LOCATION:	
Air Ejector R	Ladiation Monito	r Count Rate (1-	RM-SV-121):		cpm
Calculated To	otal Leak Rate B	ased on 1-RM-SV-	121*	gpd	
S/G BLOWDOWN A (1-RM-SS-12	RADIATION MONIT	OR COUNT RATES ( B (1-RM-S123	cpm)):	C (1-RM-SS-11	(4):
* Jeak Rate (	(gpd) = <u>(2.92 x</u> (	<u>10<sup>-4</sup>)(Air Ejecto</u> Xe-135 + Kr-87	r Flow)(1-R) + Ar-41)	<u>M-SV-121)</u>	
Prenerad Br.			Deter	Td	

1-PT-46.2 Attachment 6.5 Page 1 of 1 00-00-00

Date:	Time:	S/G LEAK RAT	ES (16:00 - vel:	20:00) <u>X</u> Air Ejec	ctor: SCFM
RCS Isotopic	s (uCi/gm): Xe	-135	Kr-87		Ar-41
RCS Isotopic	s Measured (Re	cord Sumple Time	e):		r Estimated
N-16 Radiati	on Monitor Tot.	al Leak Rate (gj	pd):		LOCATION:
Air Ejector 1	Radiation Moni	for Count Rate (	(1-RM-SV-121	):	c pa
Calculated T	otal Leak Rate	Based on 1-RM-S	57-121*		bqg
Air Ejector (	Gilb Samples (	uCi/cm³): <u>Xe-13</u>	5	Kr-87	<u>Ar-41</u>
Air Ejector	Leak Rates X	2-135	<u>Kr-87</u>	!	Ar-41
Average Tota	l Leak Rate Ba	sed on Air Eject	tor Grab Sam	ples:	gpd
S/G BLOWDOWN A (1-RM-SS-1)	RADIATION MON. 22):	ITOR COUNT RATES B (1-RM-SS-1	6 (cpm). (23):	C (1	1-RM-SS-124):
* Leak Rate	(gpd) = (2.92 ;	r 10 <sup>-4</sup> )(Air Ejec (Xe-135 + Kr-	tor Flow)(1 -87 + Ar-4	-RM-SV-121) 1)	
** Leak Rate	(gpd) = <u>(Grab )</u>	Sample Activity) (RCS Ac	(Air Ejecto stivity)	r Flow)(1.08	<u>3 x 10<sup>4</sup>)</u>
Prepared By:			Date:	Ti	lme :

1-PT-46.2 Attachment 6.6 Page 1 of J 00-00-00

## S/G LEAK RATES (20:00 - 24:00)

Date:	Time: Po	wer Level: X	Air Ejector: SCFM
RCS Isotopics (	Ci/gm): Xe-135	Kr-87	Ar-41
RCS Isotopics Me	asured (Record Samp	le Time):	or Estimated
N-16 Radiation M	Conitor Total Leak R	ate (gpd):	LOCATION:
Air Flootor Podi	ation Monitor Count	Pate (1_DW_CV_121).	
Calculated Total	Leak Rate Based on	1-RM-SV-121	gpd
S/G BLOWDOWN RAT A (1-RM-SS-122):	LATION MONITOR COUN B (1-	T RATES (cpm) RM-SS-123):	C (1-RM-5S-124):
* Leak Rate (gpd	) = <u>(2.92 x 10<sup>-4</sup>)(A</u> (Xe-135	ir Ejector Flow)(1-RM- + Kr-87 + Ar-41)	<u>SV-121)</u>
Prepared By:		Date:	Time:



INDIVIDUAL S/C PRIMARY-TO-SECREDARY LEAK RATES (gpd)

8 8

00-00-00 TOTAL S/G LEAK RATE TREED ▲ \* N-16 ( = CAP 4.0 - RM-121 ( = H.P. Grab Samples 2,000-1,000 8 8 100 8 1 111 2 14 6. η. 1.000 2 6. 5. man in the same rank the work 3. 2\_ 0.1 6 12 18 12 6 18 6 12 18 2 DAYS AGO YESTERDAY TODAY

DATE :

1-PT-46.2 Attachment 6.8

Page 1 of 1

TOTAL S/G PRIMARY-TO-SECONDARY LEAK RATE (9pd)



RADIATION MONITOR COUNT RATE (cpm)

DATE :

1-PT-46.2 Attachment 6.9 Page 1 of 1 00-00-00

1-PT-46.2 Attachment 5-9 6.10 Page 1 of 1 00-00-00

#### GUIDANCE FOR ESTIMATING ECS ISOTOFIC ACTIVITIES

#### CONSERVATIVE ESTIMATED

ISOTOPE	HALF-LIFE	EQUILIBRIUM ACTIVITY
Kr-87 Ar-41	76 minutes 1.83 hours	3.0E-2 uC1/gram 1.5E-2 uC1/gram 2.5E-3 uC1/gram





NUMBER OF HALF-LIVES