

DUQUESNE LIGHT COMPANY

Beaver Valley Power Station

UNIT 2

2OM-53C.4.2.6.4(ISS1A)

Steam Generator Tube Leakage

Issue 1A Revision 8

Prepared by M. P. Flynn	Date 12/18/96	Pages Issued 1 through 12	Effective Date APR 09 1997
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**CONTROLLED
BVPS UNIT 2**

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
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A. PURPOSE

This procedure provides symptoms and actions to be taken in event of a small steam generator tube leak.

B. SYMPTOMS OR ENTRY CONDITIONS

1. Rising radiation levels or alarm conditions on any of the following radiation monitors:
 - [2ARC-RQ100] Air Ej Discharge (1007)
 - [2GWS-RQ102] Ej D-bed Exh (1047)
 - [2SSR-RQ100] Blowdown (1062)
2. Secondary side activity detected by routine chemistry monitoring procedures.

C. AUTOMATIC ACTIONS

1. [2SSR-RQ100] Blowdown monitor causes the following valves to close:
 - [2SSR*AOV117A,B,C] 21A,B,C SG Blowdown Sample Outside CNMT Isol
 - [2BDG*AOV100A1,B1,C1] 21A,B,C SG Blowdown Outside CNMT Isol Vlvs

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><u>NOTE</u></p> <p>This procedure may be performed in conjunction with AOP 2.51.1, "Emergency Shutdown."</p>		
<p>1. <u>Request Support As Follows:</u></p> <ul style="list-style-type: none">a. Request Chemistry to calculate SG primary-to-secondary leak rate.b. Request Chemistry to perform isotopic analysis for dose equivalent I-131 for the leaking SG.c. Request Health Physics to estimate SG primary-to-secondary leakrate using:<ul style="list-style-type: none">• [2ARC-RQ100]• [2SSR-RQ100]		

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
-----------------	---------------------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	<p><u>Primary-To-Secondary Leakrate Should Be Closely Monitored During The Performance Of This Procedure</u></p> <p>a. Determine leakrate by Chemistry sample results or Health Physics results. (There is no need to wait for Chemistry to verify Air Ejector Monitor results.)</p> <p>b. The leakrate should be plotted and the rate of change determined.</p> <p>c. <u>IF</u> SG primary-to-secondary leakrate exceeds 150 GPD in any one SG, <u>THEN</u> shutdown to Mode 3 within 6 hours.</p> <p>d. <u>IF</u> SG primary-to-secondary leakrate exceeds 30 GPD in any one SG, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none">1) Have Chemistry increase sample monitoring to requantify SG primary-to-secondary leakrate.2) Have Health Physics monitor radiation monitors and estimate SG primary-to-secondary leakrate by converting $\mu\text{Ci/cc}$ to GPD every 15 minutes.<ul style="list-style-type: none">• [2ARC-RQ100]• [2SSR-RQ100] <p>e. Request Chemistry perform Chemistry Manual Chapter 5.12, "Enhanced Primary-To-Secondary Leakrate Monitoring Program."</p>	

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Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision
------------------------	--	----------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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2. (continued from previous page)

- f. The following actions should be based on the highest primary-to-secondary leakrates obtained from Chemistry or Health Physics estimates:

Primary-To-Secondary Leakrate For Any One SG	Required Actions
SG leakrate rate of rise ≥ 60 GPD/HR	Perform an emergency shutdown in accordance with AOP 2.51.1, "Emergency Shutdown" and be in Mode 3 as quickly as possible.
SG leakrate ≥ 150 GPD AND rate of rise < 60 GPD/HR	Shutdown plant and be in Mode 3 within 6 hours.

CAUTION

20ST-6.2 (20ST-6.2A) and Chemistry leakage estimates will not agree as primary-to-secondary leakage rises greater than 0.5 GPM. Chemistry leakage estimates become less accurate as leakage rises.

3. Perform Either Of The Following:

- 20ST-6.2, "Reactor Coolant System Water Inventory Balance"

-OR-

- 20ST-6.2A, "Computer Generated Reactor Coolant System Water Inventory Balance"

4. Request Chemistry Sample Secondary Coolant For Specific Activity

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
-----------------	---------------------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	<u>Verify Compliance With T.S. 3.4.6.2, "Operational Leakage" And 3.7.1.4, "Activity"</u>	Take action in accordance with Technical Specifications. Refer to EPP for notification requirements.
6.	<u>Check [2MSS*R0101A.(B).(C)] (1005, 2005; 3005, 4005; 5005, 6005), Main Steam Line Radiation Monitors - AVAILABLE</u> a. Notify Health Physics that Main Steam Line Radiation Monitors will be placed in service. b. Open [2MSS*SOV120], Main Steamline Rad Monitor Disch Isol.	

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision
-----------------	---------------------------------------	----------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	<p><u>Isolate Steam Supply From Affected SG To [2FWE*P22], Steam Driven Aux Feed Pump</u></p> <p>a. Dispatch operator with Key SR/14 to close valve for affected SG (MSCV - 773'):</p> <ul style="list-style-type: none">• SG 21A [2MSS-15], Stm Supply Isol To [2FWE*T22]• SG 21B [2MSS-16], Stm Supply Isol To [2FWE*T22]• SG 21C [2MSS-17], Stm Supply Isol To [2FWE*T22] <p>b. Ensure [2FWE*P22] is capable of being supplied by checking open the following for the two unaffected SGs:</p> <ul style="list-style-type: none">• SG 21A [2MSS-15], Stm Supply Isol To [2FWE*T22]• SG 21B [2MSS-16], Stm Supply Isol To [2FWE*T22]• SG 21C [2MSS-17], Stm Supply Isol To [2FWE*T22]	

(step continued next page)

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
-----------------	---------------------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	(continued from previous page)	
	<p>c. Since the turbine driven aux feed pump steam supply isolation SOVs from SG 21C are dual power supplied, it is necessary to "HARDEN" the supply from SG 21C as follows:⁴</p> <p><u>IF</u> SG 21C is affected, <u>THEN</u> GO TO Step 8.</p> <p><u>IF</u> SG 21A is affected, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Close [2FWE*TTV22], Trip And Throttle Valve For [2FWE*P22] (SFGDS - 718'). 2) Open and then close [2MSS*SOV105C], Turb Driven AFW Pump Stm Hdr C Supply Isol. 3) Open and caution tag [2MSS*SOV105F], Turb Driven AFW Pump Stm Hdr C Supply Isol. 4) Open [2FWE*TTV22], Trip And Throttle Valve For [2FWE*P22] in accordance with 20M-24.4.R, "Resetting And Opening TDAFW Pump Trip And Throttle Valve." 5) GO TO Step 8. <p><u>IF</u> SG 21B is affected, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Close [2FWE*TTV22], Trip And Throttle Valve For [2FWE*P22] (SFGDS - 718'). 2) Open and caution tag [2MSS*SOV105C], Turb Driven AFW Pump Stm Hdr C Supply Isol. 3) Open [2FWE*TTV22], Trip And Throttle Valve For [2FWE*P22] in accordance with 20M-24.4.R, "Resetting And Opening TDAFW Pump Trip And Throttle Valve." 	

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision
-----------------	---------------------------------------	----------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.	<u>Isolate Flow From Affected SG</u>	
a.	Adjust affected SG Atm Stm Dump setpoint to 100%:	
	<ul style="list-style-type: none"> • SG 21A [2SVS*PCV101A] • SG 21B [2SVS*PCV101B] • SG 21C [2SVS*PCV101C] 	
b.	Verify affected SG Atm Stm Dump - CLOSED	
	<ul style="list-style-type: none"> • SG 21A [2SVS*PCV101A] • SG 21B [2SVS*PCV101B] • SG 21C [2SVS*PCV101C] 	
		<p>b. <u>WHEN</u> affected SGs pressure is less than 1040 PSIG, <u>THEN</u> verify SG Atm Stm Dumps close.</p> <p><u>IF NOT, THEN</u> locally isolate the SG Atm Stm Dump for the affected SG by closing the appropriate isolation valve (MSVR - 773'):</p> <ul style="list-style-type: none"> • SG 21A [2SVS*23] • SG 21B [2SVS*24] • SG 21C [2SVS*25]
c.	Dispatch operator to locally isolate [2SVS*HCV104], Residual Heat Release Valve from affected SG by closing appropriate valve (MSVR - 773'):	
	<ul style="list-style-type: none"> • SG 21A [2SVS*27], Main Steam Residual Heat Release Isol Valve • SG 21B [2SVS*28], Main Steam Residual Heat Release Isol Valve • SG 21C [2SVS*29], Main Steam Residual Heat Release Isol Valve 	
9.	<u>Perform 20M-25.4.M. "Operating With Primary To Secondary Leakage"</u>	

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
-----------------	---------------------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	<p><u>Primary-To-Secondary Leakrate - LESS THAN 142 GPD</u> Perform the following:</p> <ul style="list-style-type: none">a. Realign [2WOS-OWS21,22,23,24] Oil/Water Separators' effluent to Steam Generator Blowdown Hold Tanks in accordance with 20M-41D.4.D, "Operation of the Oil/Water Separators."b. Control contamination by performing the following:<ul style="list-style-type: none">1) Close [2DBS-91], Floor Drain Isolation To 2DBS System (MSCV - 718').2) Open [2DBS-124], Floor Drain Isolation To [2DAS-TK206] (MSCV - 718').c. Refer to ODCM Appendix C 4.11.1.1.4, "Liquid Effluents - Concentrations" for sample requirements.	

Number 2.6.4	Title Steam Generator Tube Leakage	Issue 1A Revision
------------------------	--	----------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	<u>Request Health Physics Assistance</u> a. Request Health Physics support for the following: <ol style="list-style-type: none"> 1) Have Health Physics reset alarm setpoints 30 GPD above existing baseline reading (permits detection of rapidly rising leakrate). 2) On a predetermined frequency, have Health Physics record trend readings on radiation monitors showing above normal or alarm activity levels. 3) Perform water and air sampling at various areas in Turbine Building and other areas deemed necessary by Health Physics supervision. 4) Survey Steam Generator Blowdown path at frequency established by Health Physics to ensure positive radiological control. 	
12.	<u>Determine Need To Transfer Auxiliary Steam From Main Steam System In Accordance With Either Of The Following</u> <ul style="list-style-type: none"> • 20M-27A.4.B, "Transferring Auxiliary Steam Supply From Main Steam To The Auxiliary Boilers" • 1/20M-27.4A.B, "Supplying Unit 2 With Auxiliary Steam From Unit 1" 	
13.	<u>If Desired To Cleanup Condensate, Perform 20M-22B.4.A, "Placing The Condensate Demineralizers In Service"</u>	

Number 2,6.4	Title Steam Generator Tube Leakage	Issue 1A Revision 8
-----------------	---------------------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	<u>If The Plant Is In Mode 3, 4, 5 Or 6, And It Is Desired To Process Condensate As Liquid Waste, Perform The Following:</u> a. Open any one drain valve on the condensate side of the 2nd, 3rd, 4th or 5th point heaters to allow draining of condensate to the nearest floor drain (Turb Bldg - 730'). b. Process Turbine Bldg Sump effluent in accordance with 20M-41D.4.D, "Operation Of The Oil/Water Separators." c. Liquid waste should be processed in accordance with 20M-17.4 Operating Procedures, as appropriate.	
15.	<u>Continue These Surveillances Until Leaking Steam Generator Is Isolated For Repair</u>	

- END -

Number	Title	Issue 1A Revision
2.6.4	Steam Generator Tube Leakage	

REFERENCES

1. Issue 1, Revision 10: BVPS Radcon Manual.
2. Issue 1, Revision 10: BVPS-2 Technical Specifications.
3. Issue 1A, Revision 0: OMDR 2-90-0649, OMCN 2-90-15, 2-89-1509.
4. Issue 1A, Revision 1: DLW-93-195 dated 3/9/93; ND2NSM:5905 dated 2/5/93; ND2N02:0373 dated 2/1/93; ND3NSM:5892 dated 1/28/93; ND3NSM:5906 dated 2/5/93; OMDR 2-89-0488, 0489, 2-90-0818, 0839, 1013, 2-91-0183, 0269, 0271, 2-92-0921, 2-93-0176; Walkthrough Validation Comment (9/24/92); Table Top Validation Comment (6/25/93), OSC Subcommittee Comments (6/30/93).
5. Issue 1A, Revision 2: OMCN 2-94-01; SOER 93-1; ND1DMS:0252; OMCN 2-94-25.
6. Issue 1A, Revision 3: OMCR 2-95-0106; Table Top Validation Comment (3/8/95).
7. Issue 1A, Revision 4: OMCR 2-95-0410; TS Amendment 70.
8. Issue 1A, Revision 5: PR 2-95-304.
9. Issue 1A, Revision 6: ODCM (Issue 3, Revision 1).
10. Issue 1A, Revision 7: OMCR 1-95-0615; INPO SOER 93-1, "Diagnosis And Mitigation Of Reactor Coolant System Leakage Including Steam Generator Tube Ruptures"; OSC Subcommittee Comment (8/29/95).
11. Issue 1A, Revision 8: OMCR 2-96-0749; EPRI TR-104788, "PWR Primary-To-Secondary Leak Guidelines"; OSC Subcommittee Comment (12/16/96).