



Constellation Energy

R.E. Ginna Nuclear Power Plant, LLC

November 4, 2005

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Emergency Operating Procedures
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,

Dave A. Holm

DAH/jdw

xc: U.S. Nuclear Regulatory Commission
Region I
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Ginna USNRC Senior Resident Inspector

Enclosure(s):

AP Index
AP-SG.1, Rev 5

A002

NPSP0200
E66429

Ginna Nuclear Power Plant
PROCEDURE INDEX

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INPUT PARAMETERS: TYPE: PRAP STATUS VALUE(S): EF, QU 5 YEARS ONLY:
PRAP ABNORMAL PROCEDURE

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-CCW.1	LEAKAGE INTO THE COMPONENT COOLING LOOP	017	06/30/2004	06/26/2002	06/26/2007	EF
AP-CCW.2	LOSS OF CCW DURING POWER OPERATION	020	04/28/2005	06/26/2002	06/26/2007	EF
AP-CCW.3	LOSS OF CCW - PLANT SHUTDOWN	017	04/28/2005	06/26/2002	06/26/2007	EF
AP-CR.1	CONTROL ROOM INACCESSIBILITY	023	10/28/2005	06/26/2002	06/26/2007	EF
AP-CVCS.1	CVCS LEAK	014	06/30/2004	06/03/2002	06/03/2007	EF
AP-CVCS.3	LOSS OF ALL CHARGING FLOW	005	04/10/2005	02/27/2004	02/27/2009	EF
AP-CW.1	LOSS OF A CIRC WATER PUMP	012	09/17/2004	04/16/2003	04/16/2008	EF
AP-ELEC.1	LOSS OF 12A AND/OR 12B BUSSES	028	01/21/2005	06/26/2002	06/26/2007	EF
AP-ELEC.2	SAFEGUARD BUSSES LOW VOLTAGE OR SYSTEM LOW FREQUENCY	011	06/10/2004	06/26/2002	06/26/2007	EF
AP-ELEC.3	LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350 F)	013	01/21/2005	06/26/2002	06/26/2007	EF
AP-ELEC.13/15	LOSS OF BUS 13/15	001	06/30/2004	09/24/2003	09/24/2008	EF
AP-ELEC.14/16	LOSS OF SAFEGUARDS BUS 14/16	009	01/21/2005	06/26/2002	06/26/2007	EF
AP-ELEC.17/18	LOSS OF SAFEGUARDS BUS 17/18	008	01/21/2005	06/26/2002	06/26/2007	EF
AP-FW.1	ABNORMAL MAIN FEEDWATER FLOW	016	06/30/2004	06/26/2002	06/26/2007	EF
AP-IA.1	LOSS OF INSTRUMENT AIR	018	06/26/2002	04/16/2003	04/16/2008	EF
AP-PRZR.1	ABNORMAL PRESSURIZER PRESSURE	015	06/30/2004	06/26/2002	06/26/2007	EF
AP-RCC.1	CONTINUOUS CONTROL ROD WITHDRAWAL/INSERTION	009	06/30/2004	04/16/2003	04/16/2008	EF
AP-RCC.2	RCC/RPI MALFUNCTION	012	04/10/2005	2/20/51/2	01/22/2007	EF
AP-RCC.3	DROPPED ROD RECOVERY	007	04/28/2005	02/25/2003	02/25/2008	EF
AP-RCP.1	RCP SEAL MALFUNCTION	017	06/30/2004	04/24/2003	04/24/2008	EF
AP-RCS.1	REACTOR COOLANT LEAK	017	06/30/2004	04/16/2003	04/16/2008	EF
AP-RCS.2	LOSS OF REACTOR COOLANT FLOW	012	06/30/2004	04/16/2003	04/16/2008	EF
AP-RCS.3	HIGH REACTOR COOLANT ACTIVITY	011	06/30/2004	04/01/2002	01/22/2007	EF
AP-RCS.4	SHUTDOWN LOCA	017	03/18/2005	04/30/2003	04/30/2008	EF
AP-RHR.1	LOSS OF RHR	019	04/30/2003	04/30/2003	04/30/2008	EF
AP-RHR.2	LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	015	04/05/2005	04/30/2003	04/30/2008	EF
AP-SG.1	STEAM GENERATOR TUBE LEAK	005	11/04/2005	06/26/2002	06/26/2007	EF
AP-SW.1	SERVICE WATER LEAK	021	09/17/2004	04/21/2003	04/21/2008	EF
AP-SW.2	LOSS OF SERVICE WATER	007	01/21/2005	1/20/50/3	10/31/2006	EF
AP-TURB.1	TURBINE TRIP WITHOUT RX TRIP REQUIRED	015	06/10/2005	06/26/2002	06/26/2007	EF

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INPUT PARAMETERS: TYPE: PRAP

STATUS VALUE(S): EF, QU

5 YEARS ONLY:

PRAP ABNORMAL PROCEDURE

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-TURB.2	TURBINE LOAD REJECTION	021	04/10/2005	06/26/2002	06/26/2007	EF
AP-TURB.3	TURBINE VIBRATION	014	07/01/2005	06/26/2002	06/26/2007	EF
AP-TURB.4	LOSS OF CONDENSER VACUUM	018	04/10/2005	04/30/2003	04/30/2008	EF
AP-TURB.5	RAPID LOAD REDUCTION	008	04/10/2005	06/26/2002	06/26/2007	EF

PRAP TOTAL: 34

GRAND TOTAL: 34

EOP: AP-SG.1	TITLE: STEAM GENERATOR TUBE LEAK	REV: 5 PAGE 1 of 33
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GINNA STATION
CONTROLLED COPY NUMBER 23

Richard D. Smith
RESPONSIBLE MANAGER

11-4-2005
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP:	TITLE:	REV: 5
AP-SG.1	STEAM GENERATOR TUBE LEAK	PAGE 2 of 33

A. PURPOSE - This procedure provides the necessary instructions to be taken in the event of a Steam Generator tube leak within the capacity of the charging pumps.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITION - This procedure is entered from:

- a. AP-RCS.1, REACTOR COOLANT LEAK, if S/G tube leak is indicated.
- b. AR-PPCS-1, SGTL INDICATED, when R-15A-5 is increasing for greater than one minute.
- c. AR-RMS-15, R15 AIR EJECTOR, AR-RMS-19, R-19 STEAM GEN BLOWDOWN, when SG sample indicates a tube leakrate of greater than 5 gpd.
- d. AR-RMS-31, R31 STEAM LINE A and AR-RMS-32, R32 STEAM LINE B when other indications of SG tube leakage exist.
- e. Shift Supervisor discretion.

2. SYMPTOMS - Symptoms of STEAM GENERATOR TUBE LEAK are:

- a. Primary to secondary tube leak rate in one S/G has been verified by sampling to be greater than or equal to 5 gpd.
- b. Either of the following indicating a leak rate of greater than or equal to 5 gpd AND increasing for greater than one minute:
 - o R15A5G
 - OR
 - o Sping (using R15A5 conversion table, Curve Book #06-004)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 1 Monitor PRZR Level - STABLE AT PROGRAM LEVEL		<p><u>IF</u> PRZR level decreasing, <u>THEN</u> start additional charging pumps and increase speed as necessary to stabilize PRZR level.</p> <p><u>IF</u> PRZR level continues to decrease, <u>THEN</u> close letdown isolation, AOV-427 and excess letdown AOV-310.</p> <p><u>IF</u> available charging pumps are running at maximum speed with letdown isolated, <u>AND</u> PRZR level is decreasing, <u>THEN</u> trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.</p>
* 2 Monitor S/G Tube Leak Rate:		
a. Estimate S/G tube leak rate:		
o Charging/Letdown mismatch		
o Δ VCT		
o PPCS Point R15A5G		
o SPING (using R15A5 conversion table, Curve Book #06-004)		
b. Check total RCS to secondary leak rate - LESS THAN 1 GALLON PER MINUTE (1440 GPD)		b. Go to Step 8.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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3 Trend S/G Leak Rate:

- a. While continuing with this procedure, perform Part A of ATT-16.1, ATTACHMENT SGTL
- b. Determine S/G leak rate:
 - o PPCS point R15A5G
 - OR-
 - o SPING (using R15A5 conversion table, Curve Book #06-004)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Determine If Shutdown Required:	
	a. S/G tube leak rate - GREATER THAN OR EQUAL TO 5 GPD	a. Perform the following: 1) Notify higher supervision 2) Return to guidance in effect
	b. S/G tube leak rate - GREATER THAN OR EQUAL TO 30 GPD	b. Perform the following: 1) Notify higher supervision 2) Determine S/G tube leak rate at least once per hour o PPCS point R15A5G -OR- o SPING (using R15A5 conversion table, Curve Book #06-004) 3) <u>IF</u> leak rate is stable <u>OR</u> decreasing for 4 consecutive hours, <u>THEN</u> reduce leak rate trending to at least once per 4 hours. o PPCS point R15A5G -OR- o SPING (using R15A5 conversion table, Curve Book #06-004) 4) Return to Step 1.
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 4 continued from previous page)	
	c. S/G tube leak rate - GREATER THAN OR EQUAL TO 75 GPD	<p>c. Perform the following:</p> <ol style="list-style-type: none"> 1) Notify higher supervision 2) Determine S/G leak rate every 15 minutes (<u>IF</u> performing a procedural loop, <u>THEN</u> use trending rates previously determined in Step 5) <ul style="list-style-type: none"> o PPCS point R15A5G <p>-OR-</p> <ol style="list-style-type: none"> o SPING (using R15A5 conversion table, Curve Book #06-004) 3) Go to Step 5.
	d. S/G tube leak rate - STABLE OR INCREASING	<p>d. Perform the following:</p> <ol style="list-style-type: none"> 1) Notify higher supervision 2) <u>IF</u> the leak rate spiked to greater than 144 gpd, <u>THEN</u> go to Step 6. <p><u>IF</u> the leak rate spiked to less than 144 gpd but has remained greater than 75 gpd for at least one hour, <u>THEN</u> go to Step 6.</p> <p><u>IF</u> the leak rate spiked to less than 144 gpd <u>AND</u> has decreased to less than 75 gpd within one hour, <u>THEN</u> return to Step 4b.</p>
	e. Go to Step 6.	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Determine Trending Requirements:	
a.	S/G leak rate - INCREASES LESS THAN 10% DURING A ONE HOUR PERIOD	a. Return to Step 1.
	<ul style="list-style-type: none"> o PPCS point R15A5G o SPING (using R15A5 conversion table, Curve Book #06-004) o Grab sample 	
b.	Trend S/G leak rate at least once per hour	
	<ul style="list-style-type: none"> o PPCS point R15A5G 	
	-OR-	
	<ul style="list-style-type: none"> o SPING (using R15A5 conversion table, Curve Book #06-004) 	
c.	Review E-3, STEAM GENERATOR TUBE RUPTURE.	
d.	At least 24 hours since one-hour leak rate trending began.	d. Return to Step 1.
e.	S/G leak rate - INCREASES LESS THAN 10% DURING the last 24 HOURS	e. Return to Step 1.
f.	Trend S/G leak rate at least once per 4 hours	
	<ul style="list-style-type: none"> o PPCS point R15A5G 	
	-OR-	
	<ul style="list-style-type: none"> o SPING (using R15A5 conversion table, Curve Book #06-004) 	
g.	Return to Step 1.	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	<p>Confirm S/G Leak Rate:</p> <ul style="list-style-type: none"> a. At least two independent indications - TREND IN THE SAME DIRECTION <ul style="list-style-type: none"> o R-31 o R-32 o PPCS point R15A5G OR SPING (using R15A5 conversion table, Curve Book #06-004) o R-15 o R-19 o Grab samples (only allowed for confirming leaks less than 144 gpd which increase at less than 30 gpd/hr) b. Notify higher supervision c. While continuing with this procedure, perform Parts A <u>AND</u> B of ATT-16.1, ATTACHMENT SGT L 	<ul style="list-style-type: none"> a. <u>IF</u> an instrument failure can be confirmed, <u>THEN</u> return to guidance in effect. Otherwise return to Step 4.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

MAINTAIN PRZR LEVEL AT 50% TO ACCOMMODATE RCS SHRINKING DURING PLANT SHUTDOWN AND COOLDOWN

NOTE: Measured leakrate depends on RCS activity level, which may increase or decrease during power reduction, depending on fuel condition. Therefore, once the power reduction has begun, R-15A should NOT be used to determine if the rate of power reduction should be changed.

7 Initiate Plant Shutdown

a. Determine S/G leakrate every 15 minutes

- o PPCS point R15A5G

-OR-

- o SPING (using R15A5 conversion table, Curve Book #06-004)

b. Check S/G leak rate - INCREASING LESS THAN 30 GPD/HR

- o Leak increases less than 15 gpd in 30 minutes (R15A5G or SPING)
- o Grab samples indicate less than 30 GPD increase in 60 minutes

b. Perform the following:

- 1) Reduce power to less than 50% RTP within 1 hour of exceeding 30 gpd/hr. (Refer to AP-TURB.5, RAPID LOAD REDUCTION)
- 2) Be in Mode 3 within 3 hours of exceeding 30 gpd/hr. (Refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN)
- 3) Go to Step 7g.

This Step continued on the next page.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 7 continued from previous page)

c. Check R15A5 - OPERABLE

c. Perform the following:

1) Be in Mode 3 within 6 hours of exceeding 75 gpd. (Refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN)

2) Go to Step 7g.

d. Check S/G leak rate - HAS REMAINED LESS THAN 144 GPD SINCE LEAK INITIATION

d. Perform the following:

1) Be in Mode 3 within 6 hours of exceeding 144 gpd. (Refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN)

2) Go to Step 7g.

e. Check S/G leak rate - REMAINED GREATER THAN 75 GPD FOR GREATER THAN ONE HOUR

e. Return to Step 1.

f. Be in Mode 3 within 24 hours of exceeding 75 gpd (Refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN)

g. Refer to ITS

o LCO 3.4.13

o LCO 3.4.16

o LCO 3.7.14

h. Check reactor - IN MODE 3

h. Return to Step 7a.

i. Go to Step 28.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8 Initiate Load Reduction

a. Notify higher supervision.

b. Verify rods in AUTOMATIC

b. Perform the following:

1) Place rods to MANUAL.

2) Adjust rods to match Tavg and Tref.

c. Reduce turbine load in Auto as follows:

c. IF Auto Control is inoperable, THEN reduce turbine load in manual at 3%/min.

1) Place Turbine EH Control in OPER PAN., IMP PRESS IN, if desired.

2) Select rate of 3%/min on thumbwheel.

3) Reduce the setter to zero.

4) Depress the GO button.

d. Initiate boration at ~2 gal/% load reduction.

e. Place PRZR backup heaters switch to ON.

f. Transfer 4160V Auxiliary load from #11 Transformer. (Refer to ATT-23.0, ATTACHMENT TRANSFER 4160V LOADS)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

EXTREME AND RAPID ROD MOTION TO MITIGATE TAVG SWINGS MAY RESULT IN LARGE POWER EXCURSIONS AND SHOULD BE AVOIDED.

* 9 Monitor RCS Tavg

- o Tavg - GREATER THAN 545°F
- o Tavg - LESS THAN 566°F

Verify control rods responding in AUTO. IF NOT. THEN place rods to MANUAL and adjust control rods to restore Tavg within limits.

IF Tavg is outside limits AND can NOT be controlled. THEN trip the reactor and go to E-0. REACTOR TRIP OR SAFETY INJECTION.

10 While Continuing With This Procedure, Perform The Following:

- a. Perform parts A AND B of ATT-16.1, ATTACHMENT SCTL
- b. Dispatch an AO to perform T-35H. NUCLEAR HOUSE HEATING STEAM TO BOILER STEAM SUPPLY CHANGE OVER

11 Request RP to obtain the following samples:

- RCS boron
- RCS activity (ITS 3.4.16)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: It is permissible to operate RCPs for limited periods without seal injection, provided CCW is being supplied to the thermal barriers.

12 Check IA Available To CNMT

- o IA pressure - > 60 psig
- o Instr Air to CNMT Isol Valve.
AOV-5392 - OPEN

Control PRZR level and pressure as follows:

- o Adjust load reduction rate
- o Ensure control rods are moving to control Tavg
- o IF CCW supplied to BOTH RCP thermal barrier heat exchangers, THEN start/stop charging pumps as necessary to control PRZR level
- o Operate proportional and backup heaters to control PRZR pressure

NOTE: With PRZR pressure controller 431K in manual, PORV-431C will not operate in the automatic mode. (Refer to TR 3.4.3)

*13 Monitor PRZR Pressure -
TRENDING TO 2235 PSIG IN AUTO

Control PRZR pressure by one of the following:

- 431K in MANUAL
- Manual control of PRZR heaters and sprays

IF PRZR pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*14	Monitor MFW Regulating Valves - RESTORING S/G LEVEL TO 52% IN AUTO	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Place affected S/G(s) MFW regulating valve in MANUAL b. Restore S/G level to 52% <p><u>IF</u> S/G level can <u>NOT</u> be controlled manually, <u>THEN</u> refer to AP-FW.1, ABNORMAL MAIN FEEDWATER FLOW.</p>
*15	Monitor PRZR Level - TRENDING TO PROGRAM IN AUTO CONTROL	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Place affected charging pumps in MANUAL b. Adjust charging pump speed to restore PRZR level to program <p><u>IF</u> PRZR level can <u>NOT</u> be controlled manually, <u>THEN</u> refer to AP-RCS.1, REACTOR COOLANT LEAK.</p>
*16	Check Steam Dump Status: <ul style="list-style-type: none"> o Annunciator G-15, STEAM DUMP ARMED - LIT o Steam dump operating properly in AUTO 	<p><u>IF</u> steam dump required but <u>NOT</u> operating, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Place STEAM DUMP MODE SELECTOR Switch to MANUAL. b. Place steam dump controller, HC-484, to MANUAL. c. Operate steam dump valves manually as necessary.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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17 Adjust Boric Acid Addition Rate As Necessary To (refer to OPG-REACTIVITY-CALC):

- o Maintain or return Δ Flux to the target band
- o Maintain control rods above insertion limits
- o Match Tavg and Tref
- o Compensate for Xenon

CAUTION

IF CONDENSATE BOOSTER PUMP "A" IS OPERATING IN PARALLEL WITH EITHER CONDENSATE BOOSTER PUMP "B" OR "C" THEN CONDENSATE BOOSTER PUMP "B" OR "C" SHOULD BE SECURED FIRST IN ORDER TO MINIMIZE OPERATING AT MINIMUM FLOW CONDITIONS.

NOTE: The load reduction should not be delayed to perform the remaining steps.

18 Check If Condensate Booster Pumps Should Be Secured

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Power < 65% <u>OR</u> Trim Valve V-9508G indicates > 80% open b. Place the auto condensate booster pump to the trip position c. Stop one condensate booster pump d. <u>WHEN</u> condensate system pressures stabilize, <u>THEN</u> stop the remaining condensate booster pump | <ul style="list-style-type: none"> a. <u>WHEN</u> power < 65% <u>OR</u> Trim Valve V-9508G indicates 80% open, <u>THEN</u> continue with Step 18b. |
|---|--|

EOP: AP-SG.1	TITLE: STEAM GENERATOR TUBE LEAK	REV: 5 PAGE 16 of 33
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	<p>Check If One MFW Pump Should Be Secured</p> <p>a. Power < 50%</p> <p>b. Verify at least one MFWP Seal Booster pump in service</p> <p>c. Two MFW Pumps running</p> <p>d. Close discharge valve for the pump to be secured</p> <ul style="list-style-type: none"> • MFW Pump A - MOV-3977 • MFW Pump B - MOV-3976 <p>e. Stop the desired MFW Pump</p> <p>f. Close the secured MFW pump recirc valve by placing the control switch in pull stop</p> <p>g. Close the service water block valve to the secured MFW pump oil cooler</p> <ul style="list-style-type: none"> • MFW Pump A - V-4701 • MFW Pump B - V-4702 	<p>a. <u>WHEN</u> power < 50%. <u>THEN</u> continue with step 19b.</p> <p>b. Notify AO to start one MFWP Seal Booster pump</p> <p>c. Go to Step 20.</p>
20	<p>Verify Trim Valves Controlling Condensate System Pressure In Auto (300-375 PSIG)</p>	<p>Place controller in manual and control pressure between 300-375 psig</p>

EOP: AP-SG.1	TITLE: STEAM GENERATOR TUBE LEAK	REV: 5 PAGE 17 of 33
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

IF MAIN FEEDWATER FLOW SHOULD DECREASE TO 25% OF FULL POWER VALUE
(.825 E+6 LBM/HR) PRIOR TO THE AMSAC SYSTEM AUTOMATICALLY BLOCKING, THEN A
TURBINE TRIP AND AUX FEED PUMPS START COULD RESULT.

21 Check AMSAC System Status

a. Power < 35% (~150 psig first stage pressure)

a. Continue with Step 22. WHEN power < 35% (~150 psig first stage pressure), THEN do Step 21b.

b. Verify AMSAC Auto Block Status Light is ON

b. Place AMSAC Manual Block switch to the BLOCK position

22 Check Heater Drain Tank Pump Status

a. Generator load < 175 MWe

a. WHEN generator load < 175 MWe, THEN continue with Step 22b.

b. Stop one Heater Drain Tank Pump

c. WHEN Heater Drain Tank level control is stable, THEN stop the second Heater Drain Tank Pump

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Check MFW Regulating Bypass Vlv Status

a. Power < 30%

a. WHEN power < 30%, THEN continue with Step 23b.

b. MFW Regulating Bypass Vlv in AUTO

b. Perform the following:

- HCV-480
- HCV-481

1) Slowly open the MFW Regulating Bypass Vlv while verifying the associated MFW Regulating Vlv compensates by closing slightly

2) Place MFW Regulating Bypass Vlv in AUTO

24 Align Systems for Low Power Operation

a. Place AOV-3959, CNDST Bypass Vlv to CLOSE

b. Place LC-107, Hotwell Level Control, to MANUAL at 50%

c. Generator load < 100 MWe

c. WHEN generator load < 100 MWe, THEN continue with step 24d.

d. Open turbine drain valves

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check If Turbine Should Be Tripped:	
a.	Check turbine load - ≤ 15 MW	a. <u>WHEN</u> turbine load is ≤ 15 MW. <u>THEN</u> continue with Step 25b.
b.	Trip the turbine.	
c.	Check turbine stop valves - CLOSED	c. Direct an AO to locally trip the turbine by placing the red TRIP lever to TRIP (west end of turbine). <u>IF</u> the turbine will <u>NOT</u> trip. <u>THEN</u> close both MSIVs.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Verify Proper Operation Of Steam Dump:	
a.	Verify annunciator G-15. STEAM DUMP ARMED - LIT	a. Place steam dump mode selector switch to MANUAL.
b.	Condenser steam dump operating in AUTO	b. <u>IF</u> steam dump <u>NOT</u> available. <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) <u>IF</u> power is greater than 8%. <u>THEN</u> ensure reactor trip and go to E-0. REACTOR TRIP OR SAFETY INJECTION. 2) Adjust intact S/G ARV setpoint to 1005 psig and verify proper operation.
c.	Tavg - TRENDING TO PROGRAM	c. <u>IF</u> temperature less than 547°F and decreasing. <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Stop dumping steam 2) <u>IF</u> cooldown continues. <u>THEN</u> close both MSIVs. <p><u>IF</u> temperature greater than 547° and increasing. <u>THEN</u> dump steam to stabilize and slowly decrease temperature to 547°F.</p> <p><u>IF</u> Tavg can <u>NOT</u> be controlled. <u>THEN</u> manually trip the reactor and go to E-0. REACTOR TRIP OR SAFETY INJECTION.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Transition to E-0 is NOT required when the reactor trip breakers are opened in the following step.

27 Shutdown The Reactor

- a. Place rods in MANUAL
- b. Drive control rods until $\leq 1\%$ RTP
- c. Press Rx trip pushbutton
- d. Verify Rx Trip breakers open
- e. Verify MRPI indicates all control and shutdown rods on bottom
- d. Dispatch A0 to locally open reactor trip breakers

NOTE: The following step is intended to start an RCS boration at the earliest opportunity. The boration endpoint is determined in Step 34.

28 Initiate RCS Boration At Maximum Rate Using FCV-110A

- a. Open AOV-110B, Reactor Makeup to Charging Pump Suction.
- b. Start BOTH BAST pumps
- c. Place FCV-110A controller to MANUAL AND adjust to full open.
- d. Verify boration flow.

IF normal boration can NOT be performed, THEN align charging pump suction to RWST

- o LCV-112B - OPEN
- o LCV-112C - CLOSED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF ANY S/G LEVEL ABOVE 52%, THEN AFW FLOW MAY BE THROTTLED IMMEDIATELY TO PREVENT S/G ISOLATION.</p> <p>*****</p>		
29	Check S/G Feed Flow Status:	
	<p>a. Manually start both MDAFW pumps</p> <p>b. Verify MDAFW Pump flow - SUFFICIENT FLOW TO MAINTAIN S/G LEVELS</p>	<p>b. Perform the following:</p> <p>1) Establish MFW flow using MFW regulating valve bypass valves.</p> <p><u>IF MFW NOT</u> available, <u>THEN</u> perform the following:</p> <p>a) Manually start TDAFW pump from the non-leaking S/G and establish flow.</p> <p>b) Adjust feed flow to restore S/G level to 52%.</p> <p>c) Go to Step 29c.</p> <p>2) Adjust feed flow to restore S/G level to 52%.</p> <p>3) Go to Step 31.</p>
	<p>c. Verify MFW flow control valves - CLOSED</p> <ul style="list-style-type: none"> • MFW regulating valves • MFW bypass valves <p>d. Close pump discharge valve for the MFP to be secured:</p> <ul style="list-style-type: none"> • MOV-3977. A MFW pump • MOV-3976. B MFW pump 	<p>c. Place A and B MFW regulating and bypass valve controllers in manual at 0% demand.</p>
This Step continued on the next page.		

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 29 continued from previous page)

- e. Stop the running MFW pump
- f. Close the secured MFW pump recirc valve by placing the control switch in PULL STOP
- g. Place A and B MFW regulating and bypass valve controllers in manual at 0% demand
- h. Adjust AFW pump flow to restore S/G level to 52%.

30 Establish Normal AFW Pump Shutdown Alignment:

- a. Place AFW bypass switches to DEF
- b. Close MDAFW pump discharge valves
 - MOV-4007
 - MOV-4008
- c. Adjust AFW bypass valves to control S/G levels at 52%
 - AOV-4480
 - AOV-4481

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Check Leaking S/G Level:	
a.	Narrow range level - GREATER THAN 17%	a. Perform the following: 1) Maintain feed flow to leaking S/G until level greater than 17%. 2) Continue with Step 33. <u>WHEN</u> leaking S/G level greater than 17%, <u>THEN</u> do Steps 32b through f.
b.	Close MDAFW pump discharge valve to leaking S/G • S/G A. MOV-4007 • S/G B. MOV-4008	b. Dispatch AO to locally close valve.
c.	Close MDAFW pump bypass valve for leaking S/G • S/G A. AOV-4480 • S/G B. AOV-4481	
d.	Pull stop MDAFW pump for leaking S/G	
e.	Close TDAFW pump flow control valve to leaking S/G • S/G A. AOV-4297 • S/G B. AOV-4298	e. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to leaking S/G. • S/G A. V-4005 • S/G B. V-4006
f.	Verify MDAFW pump crosstie valves - CLOSED • MOV-4000A • MOV-4000B	f. Manually close valves.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*33	<p>Reduce RCS Pressure To Minimize Tube Leak:</p> <ul style="list-style-type: none">a. Maintain RCS pressure low in the desired operating range (Refer to 0-2.2. PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS)b. <u>WHEN</u> RCS pressure is less than 1950 psig. <u>THEN</u> place SI block switches to BLOCK<ul style="list-style-type: none">• Train A• Train Bc. Verify SAFETY INJECTION BLOCKED status light - LIT	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>OPERATION OF BOTH RCPS IS PREFERRED TO MINIMIZE REQUIRED BORON ADDITION FOR SUBSEQUENT COOLDOWN.</p> <p>*****</p>		
34	<p>Increase RCS Boron</p> <p>a. Determine desired RCS boron concentration for subsequent cooldown (Refer to ATT-16.2. ATTACHMENT RCS BORON FOR SGTL)</p> <p>b. Borate RCS to desired concentration using FCV-110A</p> <p>c. If desired, request Reactor Engineer evaluate an alternate desired RCS boron concentration to maintain SDM during subsequent cooldown</p>	<p>b. <u>IF</u> normal boration can <u>NOT</u> be performed, <u>THEN</u> align charging pump suction to RWST</p> <p>o LCV-112B - OPEN</p> <p>o LCV-112C - CLOSED</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

35 Establish Normal Shutdown Alignment:

a. Check condenser - AVAILABLE

a. Dispatch A0 to perform ATT-17.1. ATTACHMENT SD-2.

b. Perform the following as necessary:

- o Open generator disconnects
 - 1G13A71
 - 9X13A73
- o Place voltage regulator to OFF
- o Open turbine drain valves
- o Rotate reheater steam supply controller cam to close valves
- o Place reheater dump valve switches to HAND
- o Stop all but one condensate pump and place in PULL STOP (Refer to T-5F, STARTING OR STOPPING THE CONDENSATE PUMPS)

c. Verify Bus 11A and Bus 11B energized - BOTH BUSES GREATER THAN 4 KV

c. IF either bus NOT energized, THEN refer to 0-6.9.2. ESTABLISHING AND/OR TRANSFERRING OFFSITE POWER TO BUS 12A/BUS 12B.

d. Dispatch A0 to perform ATT-17.0. ATTACHMENT SD-1

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 36e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10 ⁻¹⁰ AMPS	b. Continue with Step 37. <u>WHEN</u> flux is less than 10 ⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 36c, d and e.
c.	Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10⁻¹⁰ AMPS <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip 	c. Continue with Step 37. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 36d and e.
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). <u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION, and go to Step 37.
e.	Transfer RK-45 recorder to one source range and one intermediate range channel	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Check Rx Trip Breakers - OPEN	DO <u>NOT</u> continue until Rx trip breakers open.
38	Check RCS Boron Concentration <ul style="list-style-type: none"> a. RCS Boron Concentration - equal to or greater than required for cooldown to 500 degrees per step 34 b. Verify MRPI indicates all control and shutdown rods on bottom 	<ul style="list-style-type: none"> a. Continue boration. <u>WHEN</u> RCS boron equal to or greater than required value, <u>THEN</u> go to step 38b. b. Borate an <u>additional</u> 650 gallons of boric acid for each rod not fully inserted. <u>WHEN</u> boration complete, <u>THEN</u> continue with Step 39.
39	Initiate RCS Cooldown To 500 degrees: <ul style="list-style-type: none"> a. Check leaking S/G MSIV - CLOSED b. Place Steam Dump Mode Selector switch to MANUAL c. Initiate dumping steam to condenser from intact S/G d. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 50°F/HR e. Maintain RCS pressure low in the desired operating range (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) 	<ul style="list-style-type: none"> a. Perform the following: <ul style="list-style-type: none"> 1) Manually or locally initiate steam dump from intact S/G using S/G ARV 2) Go to step 39d c. <u>IF</u> condenser steam dumps not available, <u>THEN</u> manually or locally initiate steam dump from intact S/G using S/G ARV

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

40 Notify RP To Obtain Primary Samples Required By ITS LCO 3.4.16 (load reduction > 15% in one hour)

41 Check RCS Boron Concentration

a. RCS boron - equal to or greater than required for cooldown to 450 degrees per step 34

a. Perform the following:

1) Stop cooldown AND maintain stable RCS temperature above 500 degrees and stable.

2) Continue boration. WHEN RCS boron equal to or greater than required value, THEN go to step 41b.

b. Verify MRPI indicates all control and shutdown rods on bottom

b. Request Rx Engineer determine amount of boration required due to rods not fully inserted.

c. Borate to 2.45% CSD Curve per 0-3.1, BORON CONCENTRATION FOR THE XENON FREE ALL RODS IN - MOST REACTIVE ROD STUCK OUT SHUTDOWN MARGIN

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

42 Cooldown RCS To 450 Degrees

- a. Initiate dumping steam
- b. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 50°F/HR
- c. Maintain RCS pressure low in the desired operating range
- d. WHEN RCS pressure is less than 1500 psig, THEN isolate SI ACCUMs as follows:
 - 1) Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves
 - MOV-841, MCC C position 12F
 - MOV-865, MCC D position 12C
 - 2) Close SI ACCUM outlet valves
 - ACCUM A, MOV-841
 - ACCUM B, MOV-865
 - 3) Locally reopen breakers for MOV-841 and MOV-865
- e. Check RCS temperature - LESS THAN 460 DEGREES
- e. Continue RCS cooldown
- f. Stop the cooldown AND maintain RCS between 450 and 460 degrees
- g. WHEN RCS pressure equals leaking S/G pressure, THEN maintain stable RCS pressure

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
43	Check Normal Or Excess Letdown - IN SERVICE	<p><u>IF</u> normal letdown desired, <u>THEN</u> establish normal letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)</p> <p><u>IF</u> normal letdown <u>NOT</u> available, <u>THEN</u> establish excess letdown if desired (Refer to ATT-9.1, ATTACHMENT EXCESS L/D).</p>
44	Evaluate Long Term Plant Status:	
	a. Consult the following groups:	
	<ul style="list-style-type: none"> • Operations Staff • Plant Engineering Staff • Chemistry 	
	b. RCS boron - MEETS 2.45% CSD CURVE PER 0-3.1, BORON CONCENTRATION FOR THE XENON FREE ALL RODS IN - MOST REACTIVE ROD STUCK OUT SHUTDOWN MARGIN	<p>b. Perform the following:</p> <ol style="list-style-type: none"> 1) Continue RCS boration to CSD concentration. (Refer to 0-3.1, BORON CONCENTRATION FOR THE XENON FREE ALL RODS IN - MOST REACTIVE ROD STUCK OUT SHUTDOWN MARGIN) 2) Continue with Step 44e. <u>WHEN</u> RCS boron meets 2.45% CSD curve requirement, <u>THEN</u> do steps 44c and d.
	c. Stop RCS boration	
	d. Restore RCS makeup to desired alignment	
	e. Determine if condensate cleanup is desired	
	f. Determine appropriate cooldown method	

-END-

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AP-SG.1 APPENDIX LIST

TITLE

- 1) ATTACHMENT TRANSFER 4160V LOADS (ATT-23.0)
- 2) ATTACHMENT SD-1 (ATT-17.0)
- 3) ATTACHMENT SD-2 (ATT-17.1)
- 4) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 5) ATTACHMENT SGTL (ATT-16.1)
- 6) ATTACHMENT RCS BORON FOR SGTL (ATT-16.2)
- 7) ATTACHMENT EXCESS L/D (ATT-9.1)
- 8) ATTACHMENT LETDOWN (ATT-9.0)