WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: STEAM GENERATOR BLOWDOWN

Instruction No: 2-PTI-015-01
Revision No: 0000

PREPARED BY: James Klein / James Klein DATE: 01/17/12
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INSTRUCTION APPROVAL

JTG MEETING No: 2-13-001
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APPROVED BY : Neil A Weibl DATE: 1-31-13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: _____
JTG CHAIRMAN: _____ DATE: _____
APPROVED BY : _____ DATE: _____
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	2/1/13	ALL	Initial issue. This procedure was written using Unit 1 PTI-015-01, Rev 0 as a guide.

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Date _____

1.0 INTRODUCTION

1.1 Test Objectives

Demonstrate proper operation of the Steam Generator Blowdown (SGBD) Isolation and Flow Control Valves and demonstrate that the system is capable of achieving design flow rates.

1.2 Scope

This test demonstrates the following for the SGBD system:

A. Valve Logic testing performed prior to Hot Functional Testing (HFT)

1. Proper operation of Containment Isolation Valves (CIV) and Blowdown Isolation Valves (BIV):

   a. Valves operate from their respective Main Control Room (MCR) and Auxiliary Control Room (ACR) Handswitches.

   b. MCR indications correctly reflect valve position.

   c. Valves respond correctly to interlocks and controls (simulated or actual).

2. Proper operation of SGBD flow control valve 2-FCV-15-44:

   a. Valve operates from its respective local Handswitch and Controller.

   b. Local/MCR indications correctly reflect valve position.

   c. Valve responds correctly to interlocks and controls (simulated or actual).

3. Proper operation of SGBD flow control valve 2-FCV-15-43:

   a. Valve operates from its MCR controller.

   b. Valve responds correctly to interlocks and controls (simulated or actual).

Date _____

1.2 Scope (continued)

B. System performance testing performed during HFT.

1. SGBD HTX temperature control schemes maintain outlet temperatures within design specifications.

2. CIVs' and BIVs' stroke times are within acceptable limits.

3. SGBD chemistry parameters are within plant specifications.

4. System is capable of operating in Flood Mode by exhausting system water from the South Valve Vault Room to atmosphere.

This test does not:

A. Verify instrumentation setpoints. These are performed during instrument calibration (component testing).

B. Verify operation of SGBD flash tank components. These components will be addressed in component testing.

C. Perform Quantitative Vibration Testing of SGBD piping. This will be performed, as required, by 2-PTI-999-01 - Operational Vibration Testing.

D. Perform Thermal Expansion Testing of SGBD piping. This will be performed, as required, by 2-PTI-999-02 - Thermal Expansion.

Date _____

2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, Conduct of Test

B. 2-PTI-999-01, Operational Vibration Testing

C. 2-PTI-068-01, HFT - Heatup and Cooldown

D. 2-TOP-015-01, System Operating Instruction, Steam Generator Blowdown System

E. N3C-945, Procedure for Evaluation and Qualification of Piping System Vibrations

F. CM-6.61, Steam Generator Sampling in Hot Sample Room (Modes 1-4)

2.2 Developmental References

A. Final Safety Analysis Report Amendment 109

1. FSAR Section 10.3.5, Water Chemistry

2. FSAR Section 10.4.8, Steam Generator Blowdown System

3. FSAR Table 14.2-1 Sheet 66 of 89, Steam Generator Blowdown System Test Summary

B. Drawings

1. Flow Diagrams

a. 2-47W801-2, Rev 15, STEAM GENERATOR BLOWDOWN SYSTEM
DRA 54263-100, Rev 0
DRA 53462-001, Rev 0
DRA 53462-002, Rev 0
DRA 53462-003, Rev 0
DRA 53177-003, Rev 0
DRA 54449-001, Rev 0

b. 1-47W801-2, Rev 42, STEAM GENERATOR BLOWDOWN SYSTEM
DCA 54904-002, Rev 0

2.2 Developmental References (continued)

c. 2-47W804-2, Rev 13,CONDENSATE

d. 1-47W831-1, Rev 41,CONDENSER CIRCULATING WATER

2. Electrical

a. 2-45W600-1-3, Rev 4, MAIN STEAM SYSTEM SCHEMATIC DIAGRAMS
DRA 53217-103, Rev 0
DRA 53217-104, Rev 0

b. 2-45W600-57-8, Rev 4, SEPARATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS

c. 2-45W600-57-26, Rev 1, SEPARATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS
DRA 52641-183, Rev 0

d. 2-45W600-57-32, Rev 1, SEPARATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS

e. 2-45W600-15, Rev 3, STEAM GENERATOR BLWDN SYS SCHEMATIC DIAGRAMS
DRA 52378-135, Rev 0
DRA 54449-007, Rev 0
DRA 54449-008, Rev 0

f. 1-45W600-57-30, Rev 18, SEPARATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS
DCA 54904-017, Rev 0

g. 2-45W600-57-30, Rev 3, SEPARATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS
DRA 55801-040, Rev 0

h. 45N2690-2, Rev 6, SEPARATION AUXILIARY RELAY PNL 2-R-75 CONNECTION DIAGRAMS SH-2

i. 45N2688-1, Rev 16, SEPARATION AUXILIARY RELAY PNL 2-R-73 CONNECTION DIAGRAMS SH-1
DRA 52343-183, Rev 0

2.2 Developmental References (continued)

j. 2-45N2688-2, Rev 0, SEPARATION AUXILIARY RELAY PNL 2-R-73 CONNECTION DIAGRAMS SH-2
DRA 54142-023, Rev 0
DRA 52641-166, Rev 0
DRA 52343-288, Rev 0

k. 45N2676-4, Rev 16, SOLID STATE PROTECTION SYS TRAIN A CONNECTION DIAGRAMS SH-4

l. 45N2693-1, Rev 14, SEPARATION AUXILIARY RELAY PNL 2-R-78 CONNECTION DIAGRAMS SH-1
DRA 52343-188, Rev 1

m. 45N2693-2, Rev 11, SEPARATION AUXILIARY RELAY PNL 2-R-78 CONNECTION DIAGRAMS SH-2
DRA 54142-325, Rev 0

n. 45N2693-2, Rev E, SEPARATION AUXILIARY RELAY PNL 2-R-78 CONNECTION DIAGRAMS SH-2
DCA 52641-160, Rev 0

o. 45N2677-4, Rev 18, SOLID STATE PROTECTION SYS TRAIN B CONNECTION DIAGRAMS SH-4

p. 45N2630-75, Rev 2, MISCELLANEOUS VALVES CONNECTION DIAGRAM SH-75
DRA 54449-009, Rev 1

q. 45N2686-4, Rev 5, TURBO-GEN AUX RELAY PANEL 2-R-71 CONNECTION DIAGRAM SH 4
DRA 54449-010, Rev 0
FCR 60753 AA-01

r. 45N2686-2, Rev 6, TURBO-GEN AUX RELAY PANEL 2-R-71 CONNECTION DIAGRAM SH 2

s. 2-45N2635-53, Rev 1, LOCAL INSTRUMENT PANELS CONNECTION DIAGRAMS-SHT 53

t. 45N2635-66, Rev 19, LOCAL INSTRUMENT PANELS CONNECTION DIAGRAMS-SH 66

u. 2-45N2616-3, Rev 1, THERMOCOUPLES & RTD'S CONNECTION DIAGRAMS-SH 3

2.2 Developmental References (continued)

v. 45N1651-14, Rev 14, UNIT CONTROL BOARD PANEL 0-M-12 CONNECTION DIAGRAM SH-14
DRA 55801-039, Rev 1

w. 1-45W708-2, Rev 36, MISC 120V AC DISTRIBUTION PNLS CONNECTION DIAGRAMS

x. 1-45W708-4, Rev 20, MISC 120V AC DISTRIBUTION PNLS CONNECTION DIAGRAMS

y. 2-45W2646-4, Rev 1, UNIT CONT BD PANEL 2-M-7

3. Control/Logic

a. 2-47W610-1-1, Rev 7, ELECTRICAL CONTROL DIAGRAM MAIN STEAM SYSTEM
DRA 53606-019, Rev 0
DRA 52378-536, Rev 0

b. 2-47W610-1-1A, Rev 7, ELECTRICAL CONTROL DIAGRAM MAIN STEAM SYSTEM
DRA 52378-401, Rev 0
DRA 53606-020, Rev 0

c. 2-47W610-1-2, Rev 7, ELECTRICAL CONTROL DIAGRAM MAIN STEAM SYSTEM
DRA 52378-403, Rev 0
DRA 53606-021, Rev 0

d. 2-47W610-1-2A, Rev 7, ELECTRICAL CONTROL DIAGRAM MAIN STEAM SYSTEM
DRA 52378-405, Rev 2
DRA 53606-022, Rev 0

e. 1-47W610-15-1A, Rev 3, ELECTRICAL CONTROL DIAGRAM STEAM GEN BLOWDOWN SYSTEM
DCA 54904-015, Rev 0

f. 2-47W610-15-1, Rev 5, ELECTRICAL CONTROL DIAGRAM STEAM GEN BLOWDOWN SYSTEM
DRA 52378-537, Rev 0
DRA 53177-005, Rev 0
DRA 53177-006, Rev 1
DRA 54449-002, Rev 0

2.2 Developmental References (continued)

g. 2-47W611-15-1, Rev 3, ELECTRICAL LOGIC DIAGRAM STEAM GEN BLDN SYSTEM
DRA 52340-021, Rev 0
DRA 52378-627, Rev 0
DRA 53177-007, Rev 0
DRA 54449-003, Rev 0
DRA 54449-004, Rev 0

4. Other

a. 2-47B601-55-4, Rev 0, ELECTRICAL INSTRUMENT TABULATION 52453-007, Rev 2

b. 2-47B601-55-3, Rev 0, ELECTRICAL INSTRUMENT TABULATION

c. 2-45B655-3C, Rev 0, MAIN CONTOL ROOM ANNUNCIATOR INPUTS WINDOW BOX XA-55-3C
DRA 54449-12, Rev 1

d. 2-45B655-6F, Rev 0, MAIN CONTOL ROOM ANNUNCIATOR INPUTS WINDOW BOX XA-55-6F
DRA 52343-236, Rev 0
DRA 52630-092, Rev 1

e. 2-45B655-E3C, Rev 0, ANNUNCIATOR WINDOW BOX XA-55-3C
DRA 54449-018, Rev 0
DRA 52315-249, Rev 0

f. 2-45B655-E6F, Rev 0, ANNUNCIATOR WINDOW BOX XA-55-6F
DRA 52343-237, Rev 0

g. 2-47B601-55-1, Rev 0, INSTRUMENT TABULATION
DRA 52453-004, Rev 0

h. 2-47B601-55-2, Rev 0, INSTRUMENT TABULATION
DRA 52453-005, Rev 0

i. 2-47A615-0, Rev 1, INTEGRATED COMPUTER SYSTEM TERMINATIONS AND I/O LIST

j. 2-45B640-259D, Rev 0, CONTACT DEVELOPMENT OF CONTROL AND INSTRUMENT SWITCHES
DRA 52361-017, Rev 1

2.2 Developmental References (continued)

k. 2-45B640-128, Rev 0, CONTACT DEVELOPMENT OF CONTROL AND INSTRUMENT SWITCHES
DRA 52361-046, Rev 0

C. Documents

1. WBN2-15-4002, Rev 1, Steam Generator Blowdown System
2. WBN2-1-4002, Rev 3, Main Steam System
3. 2-TSD-15-1, Rev 2, Steam Generator Blowdown
4. 2-TSD-88-5, Rev 2, Containment Isolation System
5. Chemistry Manual Chapter 3.01, Rev 89, System Chemistry Specifications
6. SOI-15.01, Rev 60 Steam Generator Blowdown System

   To be verified against 2-TOP-015-01, (Current Rev/Draft), Steam Generator Blowdown System in Appendix A.
7. SSD-1-LPF-15-44, Rev 3, Steam Generator Blowdown Discharge to Cooling Tower

   To be verified against SSD-2-LPF-15-44, (Current Rev), Steam Generator Blowdown Discharge to Cooling Tower in Appendix A.
8. SSD-1-LPF-15-43, Rev 6, Stm Gen Blowdown Header Flow

   To be verified against SSD-2-LPF-15-43, (Current Rev), Stm Gen Blowdown Header Flow in Appendix A.
9. SSD-2-LPT-2-329A, Rev 3, Steam Generator Blowdown First Stage Heat Exchange Temperature
10. NE SSD 2-F-152, Rev 0
11. NE SSD 2-F-156, Rev 0
12. NE SSD 2-F-160, Rev 0
13. NE SSD 2-F-164, Rev 0

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.

B. Observe all Radiation Protection requirements when working in or near contaminated areas.

C. With S/G secondary system temperatures > 200°F, venting (for fill & vent operations) of the Steam Generator Blowdown (SGBD) system shall be accomplished downstream of the 1st stage heat exchangers, due to steam scald hazard to personnel.

D. During hot functional testing, various system components will be hot. Test personnel shall exercise care in order to avoid contact with these surfaces.

E. Portions of this test will be conducted in areas requiring scaffolding, ladders, and safety belts. Standard fall protection requirements shall be followed.

F. Ensure no adverse effects to the operation of Unit 1 structures, systems or components result from test performance.

G. Test Personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.

H. 2-FCV-15-44 is a U1/U2 Boundary Device controlled by TI-12.08, Control of Unit Interfaces.

I. U1 SGBD and U2 SGBD discharge to Cooling Tower Blowdown via a common line.

J. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

K. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a CTL entry made.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

L. Discrepancies between component ID tags and the description in a procedure/instruction do not require a Test Deficiency Notice (TDN) in accordance with SMP-14.0 if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. If the component label needs to be changed, a Tag Request (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

M. The Test Engineer shall be cognizant of any incorrect instrument functions during data collection. Deficiencies shall be documented on a Test Deficiency Notice and processed in accordance with SMP-14.0, Test Deficiency Notices.

N. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

O. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

P. All terminal points and connections are to be considered energized. Instrumentation must be used to determine if circuits are de-energized.

Q. Retermination of lifted leads requires that their restored bend radius be equal to or greater than the as found condition.

R. When installing fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation or visual indication.

S. Changes to SDBD total flowrate should be limited to less than a 50 gpm change in any minute to minimize impacts to RCS temperature changes.

T. 2-FCV-15-43 should be used to manually isolate SGBD to prevent flashing upstream of the 1st stage heat exchangers.

U. Sections 6.5 through Section 6.8 are performed during 2-PTI-068-01, HFT - Heatup & Cooldown.

V. During the performance of this procedure visual observation of piping and components is required. This includes steady state and transient operations with visual confirmation that vibration is not excessive.

W. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN).

Date _____

4.0 PREREQUISITE ACTIONS

NOTES

1) Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the performance sections to which they apply.
2) Prerequisites applicable only to specific performance sections are annotated as such. Prerequisite with no specific performance section annotation are required prior to starting Section 6.0.

4.1 Preliminary Actions

[1] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision and as needed, each test person assisting in this test has the current revision including any change notices. _____

[2] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, **AND**

ATTACH to this PTI for use during the performance of this PTI. _____

[3] **ENSURE** changes to the references listed on Appendix A have been reviewed, and determined NOT to adversely affect the test performance. _____

[4] **VERIFY** current revisions and change paper for referenced drawings has been reviewed and determined NOT to adversely affect the test performance, **AND**

ATTACH documentation of current drawing revision numbers and change paper that were reviewed to data package. _____

Date _____

4.1 Preliminary Actions (continued)

[5] **ENSURE** a review of outstanding Clearances has been coordinated with Operations for impact to the test performance, **AND**

RECORD in Appendix B, Temporary Condition Log if required. _____

[6] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) and/or Plant Operations. _____

[7] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0. _____

[8] **ENSURE** communications are available for areas where testing is to be conducted. _____

[9] **PERFORM** a pretest walkdown on equipment to be tested to ensure no conditions exist that will impact test performance.

A. Section 6.0 _____

B. Section 6.5 _____

[10] **EVALUATE** open items for system 015 in Watts Bar Integrated Task Equipment List (WITEL), **AND**

ENSURE that they will NOT adversely affect the test results.

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.8 _____

Date _____

4.1 Preliminary Actions (continued)

[11] **ENSURE** required Component Testing has been completed prior to test start.

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.8 _____

[12] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Alterations (TA's) do NOT adversely impact testing, **AND**

ATTACH documentation of DCNs, EDCRs and TAs that were reviewed to the data package.

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.8 _____

Date _____

4.1 Preliminary Actions (continued)

[13] **REVIEW** preventive maintenance records for equipment within the scope of this test, **AND**

VERIFY no conditions exist that will impact test performance.

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.8 _____

[14] **VERIFY** plant instruments required for test performance have been placed in service and are within their calibration interval, **AND**

RECORD on Appendix C, Permanent Plant Instrumentation Log.

A. Section 6.3 _____

B. Section 6.4 _____

C. Section 6.5 . _____

[15] **ENSURE** the following ICS point are in scan (Section 6.5):

A. F0408A, STM GEN 1 BLOWDOWN HDR FLOW _____

B. F0428A, STM GEN 2 BLOWDOWN HDR FLOW _____

C. F0448A, STM GEN 3 BLOWDOWN HDR FLOW _____

D. F0468A, STM GEN 4 BLOWDOWN HDR FLOW _____

E. U0564, SG TOTAL BLOWDOWN FLOW _____

F. F0619A, STM GEN BLOWDOWN EFFLUENT FLOW _____

Date _____

4.1 Preliminary Actions (continued)

[16] **VERIFY** System cleanliness as required for the performance of this test has been completed in accordance with SMP-7.0 (Section 6.5). _____

[17] **ENSURE** all piping supports required for testing are installed and adjusted as required (Section 6.5). _____

[18] **ENSURE** the piping vibration test engineer has test equipment in place to support vibration testing (Section 6.6). _____

Date _____

4.2 Special Tools, Measuring and Test Equipment, Parts, and Supplies

[1] **OBTAIN** the following M&TE or equivalent:

A. [3] 0-600°F Digital Thermometers with Type T thermocouples (± 2.4°F) _____

B. [1] Thermocouple Test Set/Calibrator for Type T thermocouple (± 2°F) _____

C. [3] 0-1500 psig gages (± 0.2%) _____

D. [2] 0-60 min. Stopwatches (± 0.1 sec/hr) _____

[2] **ENSURE** the following test equipment/special tools are available:

A. [7] Switched Jumpers _____

B. Thermal grease _____

Date _____

4.3 Field Preparations

[1] **ENSURE** the system is configured in accordance with Appendix D, Electrical Lineup. _____

[2] **ENSURE** the system is configured in accordance with Appendix E, Mechanical Lineup. _____

NOTES

1) Any Annunciator points associated with 2-MUX-55-12 and 2-MUX-55-13 ONLY have master switches at the bottom of each terminal strip.
2) All points associated with 2-TBK-55-25, 2-TBK-55-26, 2-TBK-55-27 and 2-TBK-55-28 will not have individual switches or a master switch.

[3] **ENSURE** System 55, Annunciator and Sequential Events Recording System applicable TBK switches are ON, the applicable Master Switches are ON, and window software input(s) are ENABLED for the following Annunciator windows:

A. XA-55-6F/148B, ACR PNL 2-L-11A (Section 6.1) _____

B. XA-55-6F/148C, ACR PNL 2-L-11B (Section 6.1) _____

C. XA-55-3C/62F, SG BLOWDOWN DISCH TO CTBD CLOSED (Section 6.3) _____

D. XA-55-3C/61F, SG BLOWDOWN TEMP HI (Section 6.4) _____

Date _____

4.3 Field Preparations (continued)

[4] **VERIFY** the following systems are operational and have been placed in service to the extent necessary to perform this test:

A. System 235, 120V AC Vital Power System _____

B. System 236, 125V DC Vital Power System _____

C. System 237, 120V AC Instrument Power System _____

D. System 032, Control Air

- Section 6.3 _____
- Section 6.4 _____

E. System 027, Condenser Circulating Water System (Section 6.5) _____

F. System 002, Condensate System (Section 6.5) _____

G. System 014, Condensate Demineralizer System (Section 6.7) _____

[5] **VERIFY** there are no Unit 2 Phase A Containment Isolation Signals present by the ∅A window NOT LIT on either the TR-A or TR-B MASTER ISOL SIGNAL STATUS PNL (window 1 ON 2-XX-55-6C and 2-XX-55-6D) on 2-M-6.

A. Section 6.1 _____

B. Section 6.2 _____

NOTE

Prerequisite 4.3[6] shall be performed prior to 4.3[8.6]

[6] **LIFT** white wire BLW10 at 2-R-71, TB130 Pt. 3. (Drawing 45N2686-4)

_____ 1st

_____ CV

Date _____

4.3 Field Preparations (continued)

NOTE
Step 4.3[7] shall be performed prior to 4.3[8.7]

[7] **LIFT** wire BLWX at 2-L-309, at 2-FS-2-35 Pt. 6. (Drawing 2-45N2635-53)

_____
1st

_____
CV

Date _____

4.3 Field Preparations (continued)

NOTE

Below is a description of the purpose off each jumper installed in step 4.3[8]:

- TS-R73-RA1 will allow simulation of a Train A Accident start signal to the motor driven AFW pumps (MD AFWPs)
- TS-R73-RA2 will allow simulation of a Train A Accident start signal to the TD AFWP
- TS-R78-RB1 will allow simulation of a Train B Accident start signal to the MD AFWPs
- TS-R78-RB2 will allow simulation of a Train B Accident start signal to the TD AFWP
- TS-M12-KIR will allow simulation of high radiation level in the SGBD discharge line
- TS-R71-XY will allow simulation of low flow at CCW diffuser outlets
- TS-L309-FS35 will allow simulation of low flow through the Condenser Hotwell Pump Discharge Header

[8] **INSTALL** switched jumpers at the following locations, **AND**

ENSURE that the jumper switches are OPEN (OFF):

[8.1] LABELED TS-R73-RA1:
In Panel 2-R-73, at relay RA1 (row/column A6), wires labeled G5-3 & G5-4 (relay contacts 15 & 16).
(Drawing 2-45N2688-1)

A. Jumper Installed _____ 1st _____ CV

B. Jumped Switch OPEN (OFF) _____

Date _____

4.3 Field Preparations (continued)

[8.2] LABELED TS-R73-RA2:
In Panel 2-R-73, at relay RA2 (row/column G5), across wires labeled K19-2 & B3-2 (relay contacts 3 & 4).
(Drawing 2-45N2688-2)

A. Jumper Installed

_____ 1st

_____ CV

B. Jumped Switch OPEN (OFF) _____

[8.3] LABELED TS-R78-RB1:
In Panel 2-R-78, at relay RB1 (row/column A6), across wires labeled H7-3 & H7-4 (relay contacts 15 & 16).
(Drawing 2-45N2693-1)

A. Jumper Installed

_____ 1st

_____ CV

B. Jumped Switch OPEN (OFF) _____

[8.4] LABELED TS-R78-RB2:
In Panel 2-R-78, at relay RB2 (row/column H7), across wires labeled K9-2 & J6-2 (relay contacts 3 & 4)
(Drawing 2-45N2693-2)

A. Jumper Installed

_____ 1st

_____ CV

B. Jumped Switch OPEN (OFF) _____

Date _____

4.3 Field Preparations (continued)

[8.5] LABELED TS-M12-KIR:
In Panel 0-M-12, at TB2-2B, across wires KIRX & KIRI (Pts. 1 & 2). (Drawing 45N1651-14)

A. Jumper Installed _____ 1st _____ CV

B. Jumped Switch OPEN (OFF) _____

[8.6] LABELED TS-R71-XY:
In Panel 2-R-71, at TB130, across wires BLW10 (W, lifted from Pt. 3) & BLW11 (BK, Pt. 2).
(Drawing 45N2686-4)

A. Jumper Installed _____ 1st _____ CV

B. Jumped Switch OPEN (OFF) _____

[8.7] LABELED TS-L309-FS35
In Panel 2-L-309, at 2-FS-2-35, across lifted wire BLWX (lifted from Pt. 6) and wire BLW8 (Pt. 7).
(Drawing 2-45N2635-53)

A. Jumper Installed _____ 1st _____ CV

B. Jumped Switch OPEN (OFF) _____

Date _____

4.3 Field Preparations (continued)

NOTE
Thermocouple Test Set/Calibrator will allow for simulation of high temperature the SGBD 1st stage HTX discharge line.

[9] **INSTALL** Thermocouple Test Set/Calibrator per the following instructions at 2-TS-15-43 [2-L-164, T11J/712] (Drawing 45N2635-66) (Section 6.4):

A. **LIFT** the negative thermocouple wire (R) from Pt 1. _____ 1st _____ CV

B. **LIFT** the positive thermocouple wire (BL) from Pt 2. _____ 1st _____ CV

C. **INSTALL** negative test lead at Pt 1. _____ 1st _____ CV

D. **INSTALL** positive test lead at Pt 2. _____ 1st _____ CV

[10] **INSTALL** Thermocouple Test Set/Calibrator per the following instructions at 2-TS-15-43 [2-L-164, T11J/712] (Drawing 45N2635-66) (Section 6.5):

Date _____

4.3 Field Preparations (continued)

A. **SET** the Test Set/Calibrator to monitor for temperature. _____

B. **INSTALL** negative test lead on the negative thermocouple wire (R) at Pt 1. _____ 1st _____ CV

C. **INSTALL** positive test lead on the positive thermocouple wire (BL) at Pt 2. _____ 1st _____ CV

NOTE

Pressure gages must be placed at the same elevation as the centerline of the process pipe that the drain lines tee off of.

[11] **INSTALL** 0-1500 psi pressure gages at the following locations (Section 6.5):

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN [T10J/708]. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN [T10G/708]. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN [T15H/708]. _____

Date _____

4.3 Field Preparations (continued)

NOTE

Thermal grease should be used in thermowells to reduce themowell temperature gradient and temperature response time.

[12] **INSTALL** 0-600°F Digital Thermometer with Type T thermocouple at the following thermowells (Section 6.5):

A. 2-TW-2-330A, SGB 2ND STAGE HX TEST WELL [T15H/708]. _____

B. 2-TW-2-330B, SGB 2ND STAGE HX TEST WELL [T15H/708]. _____

C. 2-TW-2-329B, SGB 1ST STAGE HX TEST WELL [T10G/708] _____

[13] **VERIFY** Measuring and Test Equipment (M&TE) required for test performance has been filled & vented (as required), and placed in service, **AND**

RECORD applicable information on the Measuring and Test Equipment Log (Section 6.5). _____

Date _____

4.3 Field Preparations (continued)

NOTES

1) Maximum U2 SGBD flows will be determined by the listed performance sections. Each unit's SDBD discharges to CTBD via a common line. U1 discharge into this line could impact max flowrate determination.
2) If U1 SGBD is currently aligned to CTBD and it is undesirable to route SGBD entirely to U1 Condensate Demineralizers, request discharge to U1 CTBD to be minimized and make a CTL entry.

[14] **REQUEST** U1 Operations to eliminate/reduce U1 SGBD discharge to Cooling Tower Blowdown for the duration of the following Sections.

A. Section 6.5 _____

B. Section 6.6 _____

C. Section 6.7 _____

D. Section 6.8 _____

Date _____

4.4 Approval and Notifications

[1] **OBTAIN** permission of the Preoperational Startup Manager to start the test.

_____ _____
Preoperational Startup Manager Signature — Date

[2] **OBTAIN** the Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

_____ _____
Unit 2 US/SRO/SM Signature — Date

[3] **OBTAIN** the Unit 1 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

_____ _____
Unit 1 US/SRO/SM Signature — Date

[4] **NOTIFY** the Chemistry Department prior to starting Section 6.5 _____

5.0 ACCEPTANCE CRITERIA

A. Steam Generator Blowdown (SGBD) Valve Logic

1. The following valves CLOSE in response to a Phase A Containment Isolation signal and remain closed after signal is removed:

Valve	CLOSES on Phase A	Remains Closed after Phase A is reset
Train A		
2-FCV-1-14	6.2.2[27]	6.2.2[29]
2-FCV-1-32	6.2.2[27]	6.2.2[29]
2-FCV-1-181	6.2.2[31]	6.2.2[33]
2-FCV-1-183	6.2.2[31]	6.2.2[33]
Train B		
2-FCV-1-7	6.2.3[27]	6.2.3[29]
2-FCV-1-25	6.2.3[27]	6.2.3[29]
2-FCV-1-182	6.2.3[27]	6.2.3[29]
2-FCV-1-184	6.2.3[27]	6.2.3[29]

5.0 ACCEPTANCE CRITERIA (continued)

2. The following valves' manual controls (handswitch, transfer switch, controller, as applicable) and indications (e.g. indicating lights, status lights, alarms) correctly control and reflect valve position:

Valve	Manual Control	Indications
2-FCV-1-7	6.1.2[11]	6.1.2[11]
2-FCV-1-14	6.1.3[11]	6.1.3[11]
2-FCV-1-25	6.1.4[11]	6.1.4[11]
2-FCV-1-32	6.1.5[11]	6.1.5[11]
2-FCV-1-181	6.1.2[11]	6.1.2[11]
2-FCV-1-182	6.1.3[11]	6.1.3[11]
2-FCV-1-183	6.1.4[11]	6.1.4[11]
2-FCV-1-184	6.1.5[11]	6.1.5[11]
2-FCV-15-43	6.4[5]	N/A
2-FCV-15-44	6.3[6], 6.3[7]	6.3[6], 6.3[7]

3. The following valves automatically close on either Motor Driven Auxiliary Feedwater Pump (MDAFW) start OR Turbine Driven Auxiliary Feedwater Pump (TDAFW) start (Trip & Throttle Valve 2-FCV-1-51 half open), as described below:

Valve	Closes on 2A-A MDAFW Pump Start	Closes on 2B-B MDAFW Pump Start	Closes on 2-FCV-1-51 Half Open (TDAFW start)
2-FCV-1-7	N/A	6.2.3[15]	6.2.3[3]
2-FCV-1-25	N/A	6.2.3[15]	6.2.3[3]
2-FCV-1-14	6.2.2[15]	N/A	6.2.2[3]
2-FCV-1-32	6.2.2[15]	N/A	6.2.2[3]

5.0 ACCEPTANCE CRITERIA (continued)

4. The AFW pump start interlocks (described above in 5.0.A.3) can be bypassed allowing the following valves to be opened:

Valve	Step
2-FCV-1-7	6.2.3[6], 6.2.3[18]
2-FCV-1-14	6.2.2[6], 6.2.2[18]
2-FCV-1-25	6.2.3[6], 6.2.3[18]
2-FCV-1-32	6.2.2[6], 6.2.2[18]

5. The AFW pump start interlock bypass functions will interrupt upon receipt of a AFW Accident/Start signal, closing the following valves:

Valve	Step
Train A Signal	
2-FCV-1-14	6.2.2[7], 6.2.2[19]
2-FCV-1-32	6.2.2[7], 6.2.2[19]
Train B Signal	
2-FCV-1-7	6.2.3[7], 6.2.3[19]
2-FCV-1-25	6.2.3[7], 6.2.3[19]

5.0 ACCEPTANCE CRITERIA (continued)

6. The interrupts on AFW Accident/Start signal (described above in 5.0.A.5) can be bypassed allowing the following valves to be opened:

Valve	Step
2-FCV-1-7	6.2.3[10], 6.2.3[22]
2-FCV-1-14	6.2.2[10], 6.2.2[22]
2-FCV-1-25	6.2.3[10], 6.2.3[22]
2-FCV-1-32	6.2.2[10], 6.2.2[22]

7. 2-FCV-15-43 will automatically close on either of the following conditions:

Condition	Step
Low Flow in Condensate Hotwell Discharge Line (2-FS-2-35)	6.4[9]
High Temp in SGBD Line, D/S of 2nd Stage HTX (2-TS-15-43)	6.4[7]A

8. 2-FCV-15-43 will automatically open when the "Low Flow in Condensate Hotwell Discharge Line" signal is removed, provided SGBD temperature is not above 2-TS-15-43 HI setpoint (Step 6.4[10]).

9. 2-FCV-15-44 will automatically close, on either of the following conditions, with its handswitch positioned as follows:

2-HS-15-44 Position	Low Flow in Cooling Tower Blowdown Diffuser Outlet (0-FS-27-98)	High Radiation in SGBD line (2-RM-90-120/121).
Auto	6.3[11]	6.3[9]
Open	N/A	6.3[13]

10. 2- FCV-15-44 can be manually opened with the Low Flow in Cooling Tower Blowdown condition (Step 6.3[12]).

5.0 ACCEPTANCE CRITERIA (continued)

11. 2- FCV-15-44 can be manually opened with the High Radiation in SGBD line condition (Step 6.3[14]).

12. Stroke CLOSE time of 2-FCV-15-44 is greater than 2.0 seconds and less than 5.0 seconds (Step 6.3[18]).

B. SGBD Performance Testing During Hot Functional Testing

1. The following valves close in $\leq$ 15.0 seconds:

Valve	Step
2-FCV-1-7	6.8.4[7]A
2-FCV-1-14	6.8.4[11]A
2-FCV-1-25	6.8.4[15]A
2-FCV-1-32	6.8.4[19]A
2-FCV-1-181	6.8.4[7]B
2-FCV-1-182	6.8.4[11]B
2-FCV-1-183	6.8.4[15]B
2-FCV-1-184	6.8.4[19]B

5.0 ACCEPTANCE CRITERIA (continued)

2. Automatic controls for 2-FCV-2-329A & 2-FCV-2-329B maintain SGBD HTX outlet temperatures below setpoint at each of the following RCS temperature plateaus:

RCS Temperature Plateau	1st Stage SGBD HTX		2nd Stage SGBD HTX
	SGBD Outlet Temp≤166°F.	Condenesate Outlet Temp≤224°F	SGBD Outlet Temp≤140°F
250°F	6.5.2[4]A	6.5.2[4]B	6.5.2[4]C
350°F	6.6.2[6]A	6.6.2[6]B	6.6.2[6]C
450°F	6.7.2[6]A, 6.7.3[6]A	6.7.2[6]B, 6.7.3[6]B	6.7.2[6]C, 6.7.3[6]C
557°F	6.8.2[6]A, 6.8.3[6]A	6.8.2[6]B, 6.8.3[6]B	6.8.2[6]C, 6.8.3[6]C

3. SGBD chemistry specifications are within the below limits (Step 6.8.4[5]):

Parameter	Acceptance Criteria
Cation Conductivity	≤2.0μS/cm @ 25°C
Sodium	≤50ppb
Chloride	≤50ppb
Sulfate	≤50ppb
Hydrazine	>2.5ppb

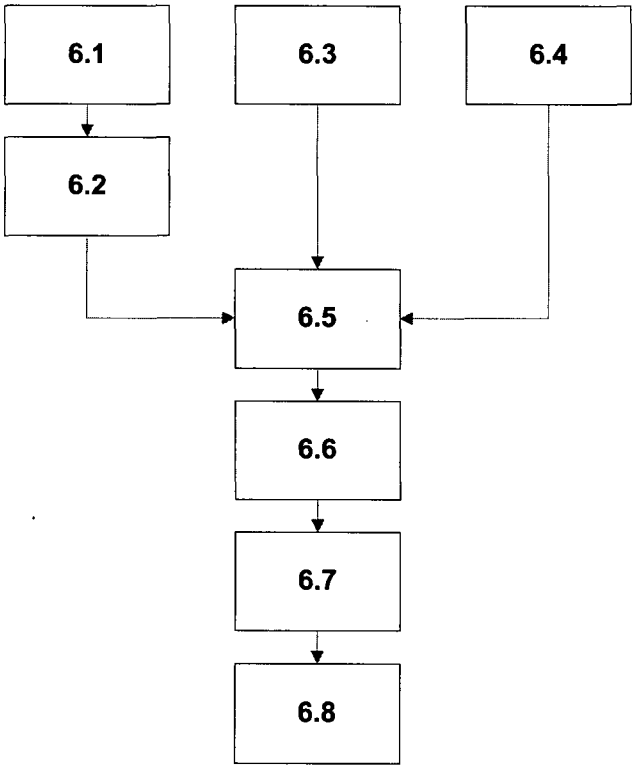
4. Total SGBD Flowrate of 360gpm can achieved, at the 557°F RCS Temperature Plateau, when SGBD is discharged to Condensate Demineralizers (6.8.2[6]D).

5. The Steam Generator Blowdown System is capable of exhausting to the roof of the U2 South Valve Vault Room in the flood mode flowpath (Step 6.8.5[3]).

6.0 INSTRUCTIONS

NOTES

1) The performance sections of this test shall be performed per the flow chart below:



2) The order of section performance for the above flow diagram is as follows:
   - Sections 6.1, 6.3, 6.4, performed in any order
   - Section 6.2 performed after 6.1
   - Section 6.5 performed after 6.2, 6.3 and 6.4
   - Sections 6.5 through 6.8 performed in sequential order
3) Unless otherwise noted, steps within each section shall be performed in the order written.

Date _____

6.1 Manual Controls, SGBD Isolation Valves

6.1.1 Preliminary Actions

[1] **ENSURE** prerequisites listed in Section 4.0 for Section 6.1 have been completed. _____

[2] **VERIFY** no Auxiliary Feedwater (AFW) Pumps are running and that any scheduled AFW testing supports performance of Section 6.1 _____

NOTE

The remaining Subsections (6.1.2 through 6.1.5) of Section 6.1 may be performed in any order

6.1.2 2-FCV-1-7 & 2-FCV-1-181, SGBD Loop 1

NOTES

1) 2-FCV-1-7 and 2-FCV-1-181 are both controlled by 2-HS-1-7/181. Both valves have status indication lights on this handswitch. The bottom row of lights (closest to the handswitch grip) is associated with 2-FCV-1-7 and the top row with 2-FCV-1-181.

2) To open valves, this handswitch must be held in the OPEN position until both valves reach full open (Red Lights ON, Green Lights OFF). Handswitch spring returns to A-P AUTO from OPEN and CLOSE.

Date _____

6.1.2 2-FCV-1-7 & 2-FCV-1-181, SGBD Loop 1 (continued)

[1] **VERIFY** the following:

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, [2-M-4]:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____
- Green Light for 2-FCV-1-181 ON _____
- Red Light for 2-FCV-1-181 OFF _____

B. On 2-XX-55-6F, Train B Containment Isolation Status Panel (CISP), [2-M-6]:

- Window 3, FCV-1-7, Green Light ON _____
- Window 3, FCV-1-7, Red Light OFF _____

[2] **PLACE** 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, to OPEN, **AND**

VERIFY the following:

A. On 2-HS-1-7/181:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____
- Green Light for 2-FCV-1-181 OFF _____
- Red Light for 2-FCV-1-181 ON _____

B. On 2-XX-55-6F, Train B CISP:

- Window 3, FCV-1-7, Green Light OFF _____
- Window 3, FCV-1-7, Red Light ON _____

Date _____

6.1.2 2-FCV-1-7 & 2-FCV-1-181, SGBD Loop 1 (continued)

[3] **PLACE** 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, to CLOSE, **AND**

VERIFY the following:

A. Green Light for 2-FCV-1-7 ON _____

B. Red Light for 2-FCV-1-7 OFF _____

C. Green Light for 2-FCV-1-181 ON _____

D. Red Light for 2-FCV-1-181 OFF _____

[4] **OPEN** the following valves using 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

A. 2-FCV-1-7 _____

B. 2-FCV-1-181 _____

[5] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR. _____

[6] **PLACE** 2-XS-1-7, SG 1 BLOWDOWN CIV [2-L-11B], to AUX, **AND**

VERIFY the following:

A. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is in ALARM _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red). _____

C. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 OFF _____
- Green Light for 2-FCV-1-181 OFF _____
- Red Light for 2-FCV-1-181 ON _____

Date _____

6.1.2 2-FCV-1-7 & 2-FCV-1-181, SGBD Loop 1 (continued)

D. On 2-XX-55-6F, Train B CISP:

- Window 3, FCV-1-7, Green Light OFF _____
- Window 3, FCV-1-7, Red Light OFF _____

[7] **PLACE** 2-XS-1-7, SG 1 BLOWDOWN CIV, to NOR, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

D. On 2-XX-55-6F, Train B CISP:

- Window 3, FCV-1-7, Green Light ON _____
- Window 3, FCV-1-7, Red Light OFF _____

[8] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR. _____

[9] **PLACE** 2-XS-1-181, SG 1 BLOWDOWN CIV IN CNTMT [2-L-11A] to the AUX position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, ALARMS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red). _____

Date _____

6.1.2 2-FCV-1-7 & 2-FCV-1-181, SGBD Loop 1 (continued)

C. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-181 OFF _____
- Red Light for 2-FCV-1-181 OFF _____
- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

[10] **PLACE** 2-XS-1-181, SG 1 BLOWDOWN CIV IN CNTMT, to the NOR position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, CLEARS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-181 ON _____
- Red Light for 2-FCV-1-181 OFF _____

[11] **VERIFY** successful completion of SubSection 6.1.2. (**Acc Crit**) _____

6.1.3 2-FCV-1-14 & 2-FCV-1-182, SGBD Loop 2

NOTES

1) 2-FCV-1-14 and 2-FCV-1-182 are both controlled by 2-HS-1-14/182. Both valves have status indication lights on this handswitch. The bottom row of lights (closest to the handswitch grip) is associated with 2-FCV-1-14 and the top row with 2-FCV-1-182.

2) To open valves, this handswitch must be held in the OPEN position until both valves reach full open (Red Lights ON, Green Lights OFF). Handswitch spring returns to A-P AUTO from OPEN and CLOSE.

Date _____

6.1.3 2-FCV-1-14 & 2-FCV-1-182, SGBD Loop 2 (continued)

[1] **VERIFY** the following:

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, [2-M-4]:

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____
- Green Light for 2-FCV-1-182 ON _____
- Red Light for 2-FCV-1-182 OFF _____

B. On 2-XX-55-6E, Train A Containment Isolation Status Panel (CISP), [2-M-6]:

- Window 1, FCV-1-14, Green Light ON _____
- Window 1, FCV-1-14, Red Light OFF _____

[2] **PLACE** 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, to OPEN, **AND**

VERIFY the following:

A. On 2-HS-1-14/182:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____
- Green Light for 2-FCV-1-182 OFF _____
- Red Light for 2-FCV-1-182 ON _____

B. On 2-XX-55-6E, Train A CISP:

- Window 1, FCV-1-14, Green Light OFF _____
- Window 1, FCV-1-14, Red Light ON _____

Date _____

6.1.3 2-FCV-1-14 & 2-FCV-1-182, SGBD Loop 2 (continued)

[3] **PLACE** 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, to CLOSE, **AND**

VERIFY the following:

A. Green Light for 2-FCV-1-14 ON _____

B. Red Light for 2-FCV-1-14 OFF _____

C. Green Light for 2-FCV-1-182 ON _____

D. Red Light for 2-FCV-1-182 OFF _____

[4] **OPEN** the following valves using 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

A. 2-FCV-1-14 _____

B. 2-FCV-1-182 _____

[5] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR. _____

[6] **PLACE** 2-XS-1-14, SG 2 BLOWDOWN CIV [2-L-11A], to AUX, **AND**

VERIFY the following:

A. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is in ALARM _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red). _____

C. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 OFF _____
- Green Light for 2-FCV-1-182 OFF _____
- Red Light for 2-FCV-1-182 ON _____

Date _____

6.1.3 2-FCV-1-14 & 2-FCV-1-182, SGBD Loop 2 (continued)

D. On 2-XX-55-6E, Train A CISP:

- Window 1, FCV-1-14, Green Light OFF _____
- Window 1, FCV-1-14, Red Light OFF _____

[7] **PLACE** 2-XS-1-14, SG 2 BLOWDOWN CIV, to NOR, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

D. On 2-XX-55-6E, Train A CISP:

- Window 1, Green Light ON _____
- Window 1, Red Light OFF _____

[8] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR. _____

[9] **PLACE** 2-XS-1-182, SG 2 BLOWDOWN CIV IN CNTMT[2-L-11B] to the AUX position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, ALARMS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red). _____

Date _____

6.1.3 2-FCV-1-14 & 2-FCV-1-182, SGBD Loop 2 (continued)

C. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-182 OFF _____
- Red Light for 2-FCV-1-182 OFF _____
- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

[10] **PLACE** 2-XS-1-182, SG 2 BLOWDOWN CIV IN CNTMT, to the NOR position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, CLEARS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

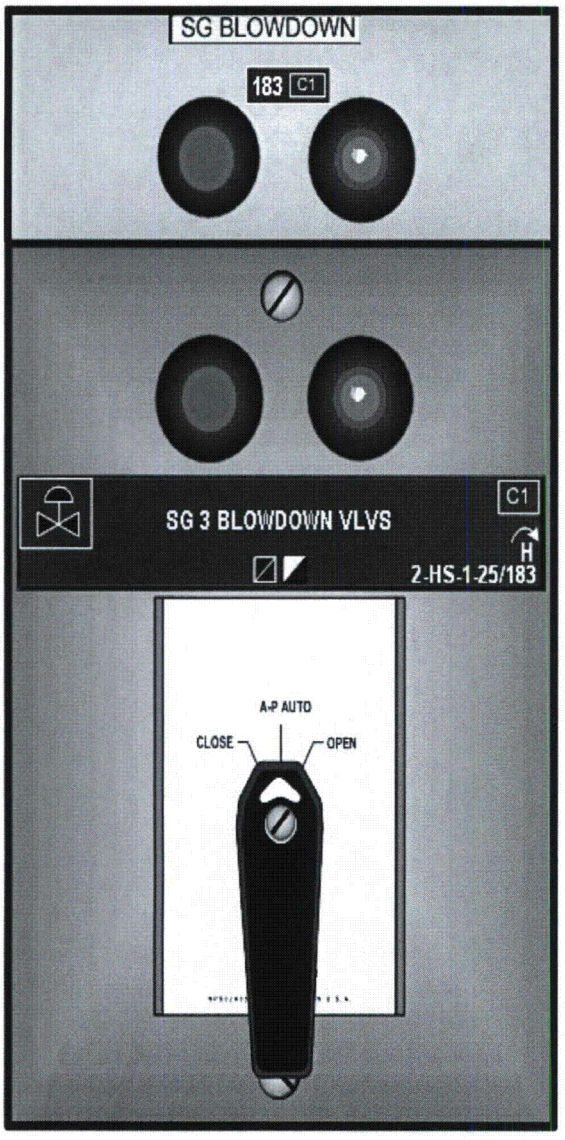
- Green Light for 2-FCV-1-182 ON _____
- Red Light for 2-FCV-1-182 OFF _____

[11] **VERIFY** successful completion of SubSection 6.1.3. (**Acc Crit**) _____

6.1.4 2-FCV-1-25 & 2-FCV-1-183, SGBD Loop 3

NOTES

1) 2-FCV-1-25 and 2-FCV-1-183 are both controlled by 2-HS-1-25/183. Both valves have status indication lights on this handswitch. The bottom row of lights (closest to the handswitch grip) is associated with 2-FCV-1-25 and the top row with 2-FCV-1-183.



2) To open valves, this handswitch must be held in the OPEN position until both valves reach full open (Red Lights ON, Green Lights OFF). Handswitch spring returns to A-P AUTO from OPEN and CLOSE.

Date _____

6.1.4 2-FCV-1-25 & 2-FCV-1-183, SGBD Loop 3 (continued)

[1] **VERIFY** the following:

A. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS, [2-M-4]:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____
- Green Light for 2-FCV-1-183 ON _____
- Red Light for 2-FCV-1-183 OFF _____

B. On 2-XX-55-6F, Train B Containment Isolation Status Panel (CISP), [2-M-6]:

- Window 4, FCV-1-25, Green Light ON _____
- Window 4, FCV-1-25, Red Light OFF _____

[2] **PLACE** 2-HS-1-25/183, SG 3 BLOWDOWN VLVS, to OPEN, **AND**

VERIFY the following:

A. On 2-HS-1-25/183:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____
- Green Light for 2-FCV-1-183 OFF _____
- Red Light for 2-FCV-1-183 ON _____

B. On 2-XX-55-6F, Train B CISP:

- Window 4, FCV-1-25, Green Light OFF _____
- Window 4, FCV-1-25, Red Light ON _____

Date _____

6.1.4 2-FCV-1-25 & 2-FCV-1-183, SGBD Loop 3 (continued)

[3] **PLACE** 2-HS-1-25/183, SG 3 BLOWDOWN VLVS, to CLOSE, **AND**

VERIFY the following:

A. Green Light for 2-FCV-1-25 ON _____

B. Red Light for 2-FCV-1-25 OFF _____

C. Green Light for 2-FCV-1-183 ON _____

D. Red Light for 2-FCV-1-183 OFF _____

[4] **OPEN** the following valves using 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

A. 2-FCV-1-25 _____

B. 2-FCV-1-183 _____

[5] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR. _____

[6] **PLACE** 2-XS-1-25, SG 3 BLOWDOWN CIV [2-L-11B], to AUX, **AND**

VERIFY the following:

A. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is in ALARM _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red). _____

C. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 OFF _____
- Green Light for 2-FCV-1-183 OFF _____
- Red Light for 2-FCV-1-183 ON _____

Date _____

6.1.4 2-FCV-1-25 & 2-FCV-1-183, SGBD Loop 3 (continued)

D. On 2-XX-55-6F, Train B CISP:

- Window 4, FCV-1-25, Green Light OFF _____
- Window 4, FCV-1-25, Red Light OFF _____

[7] **PLACE** 2-XS-1-25, SG 3 BLOWDOWN CIV, to NOR, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

D. On 2-XX-55-6F, Train B CISP:

- Window 4, FCV-1-25, Green Light ON _____
- Window 4, FCV-1-25, Red Light OFF _____

[8] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR. _____

[9] **PLACE** 2-XS-1-183, SG 3 BLOWDOWN CIV IN CNTMT [2-L-11A] to the AUX position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, ALARMS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red). _____

Date _____

6.1.4 2-FCV-1-25 & 2-FCV-1-183, SGBD Loop 3 (continued)

C. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-183 OFF _____
- Red Light for 2-FCV-1-183 OFF _____
- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

[10] **PLACE** 2-XS-1-183, SG 3 BLOWDOWN CIV IN CNTMT, to the NOR position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, CLEARS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-25/183, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-183 ON _____
- Red Light for 2-FCV-1-183 OFF _____

[11] **VERIFY** successful completion of SubSection 6.1.4. (**Acc Crit**) _____

6.1.5 2-FCV-1-32 & 2-FCV-1-184, SGBD Loop 4

NOTES

1) 2-FCV-1-32 and 2-FCV-1-184 are both controlled by 2-HS-1-32/184. Both valves have status indication lights on this handswitch. The bottom row of lights (closest to the handswitch grip) is associated with 2-FCV-1-32 and the top row with 2-FCV-1-184.

2) To open valves, this handswitch must be held in the OPEN position until both valves reach full open (Red Lights ON, Green Lights OFF). Handswitch spring returns to A-P AUTO from OPEN and CLOSE.

Date _____

6.1.5 2-FCV-1-32 & 2-FCV-1-184, SGBD Loop 4 (continued)

[1] **VERIFY** the following:

A. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS, [2-M-4]:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____
- Green Light for 2-FCV-1-184 ON _____
- Red Light for 2-FCV-1-184 OFF _____

B. On 2-XX-55-6E, Train A Containment Isolation Status Panel (CISP), [2-M-6]:

- Window 2, FCV-1-32, Green Light ON _____
- Window 2, FCV-1-32, Red Light OFF _____

[2] **PLACE** 2-HS-1-32/184, SG 4 BLOWDOWN VLVS, to OPEN, **AND**

VERIFY the following:

A. On 2-HS-1-32/184:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____
- Green Light for 2-FCV-1-184 OFF _____
- Red Light for 2-FCV-1-184 ON _____

B. On 2-XX-55-6E, Train A CISP:

- Window 2, FCV-1-32, Green Light OFF _____
- Window 2, FCV-1-32, Red Light ON _____

Date _____

6.1.5 2-FCV-1-32 & 2-FCV-1-184, SGBD Loop 4 (continued)

[3] **PLACE** 2-HS-1-32/184, SG 4 BLOWDOWN VLVS, to CLOSE, **AND**

VERIFY the following:

A. Green Light for 2-FCV-1-32 ON _____

B. Red Light for 2-FCV-1-32 OFF _____

C. Green Light for 2-FCV-1-184 ON _____

D. Red Light for 2-FCV-1-184 OFF _____

[4] **OPEN** the following valves using 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

A. 2-FCV-1-32 _____

B. 2-FCV-1-184 _____

[5] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR. _____

[6] **PLACE** 2-XS-1-32, SG 4 BLOWDOWN CIV [2-L-11A], to AUX, **AND**

VERIFY the following:

A. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is in ALARM. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red). _____

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 OFF _____
- Green Light for 2-FCV-1-184 OFF _____
- Red Light for 2-FCV-1-184 ON _____

Date _____

6.1.5 2-FCV-1-32 & 2-FCV-1-184, SGBD Loop 4 (continued)

D. On 2-XX-55-6E, Train A CISP:

- Window 2, FCV-1-32, Green Light OFF _____
- Window 2, FCV-1-32, Red Light OFF _____

[7] **PLACE** 2-XS-1-32, SG 4 BLOWDOWN CIV, to NOR, **AND**

VERIFY the following:

A. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR. _____

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

D. On 2-XX-55-6E, Train A CISP:

- Window 2, Green Light ON _____
- Window 2, Red Light OFF _____

[8] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR. _____

[9] **PLACE** 2-XS-1-184, SG 4 BLOWDOWN CIV IN CNTMT [2-L-11B] to the AUX position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, ALARMS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red). _____

Date _____

6.1.5 2-FCV-1-32 & 2-FCV-1-184, SGBD Loop 4 (continued)

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-184 OFF _____
- Red Light for 2-FCV-1-184 OFF _____
- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

[10] **PLACE** 2-XS-1-184, SG 4 BLOWDOWN CIV IN CNTMT, to the NOR position, **AND**

VERIFY the following:

A. 2-XA-55-6F-148C, ACR PNL 2-L-11B, CLEARS. _____

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green). _____

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-184 ON _____
- Red Light for 2-FCV-1-184 OFF _____

[11] **VERIFY** successful completion of SubSection 6.1.5. (**Acc Crit**) _____

Date _____

6.2 Automatic Controls, SGBD Isolation Valves

6.2.1 Preliminary Actions

NOTE

Subsections 6.2.2 and 6.2.3 may be performed in any order.

[1] **ENSURE** prerequisites listed in Section 4.0 for Section 6.2 have been completed. _____

[2] **VERIFY** no Auxiliary Feedwater (AFW) Pumps are running and that any scheduled AFW testing supports performance of Section 6.2 _____

[3] **VERIFY** the Startup Engineer responsible for System 43 testing has been consulted for any impacts to testing resulting from performance of Section 6.2. _____

Date _____

6.2.1 Preliminary Actions (continued)

NOTES

1) Valve position will be based on the CISP indication. Record as follows:
   - OPEN for Red light only ON
   - CLOSED for Green Light Only ON
2) Step 6.2.1[4] may be N/A'd if System 43 is not under PSE jurisdiction or at the discretion of the Startup Engineer responsible for System 43.

[4] **RECORD** the As-Found position of the following valves:

Valve	Description	Window	As-Found Position
2-XX-55-6E, Train A CISP			
2-FCV-43-3	PRESSURIZER GAS SAMPLE ISOL	32	
2-FCV-43-12	PRESSURIZER LIQUID SAMPLE ISOL	33	
2-FCV-43-23	HOT LEGS 1/3 SAMPLE ISOL	34	
2-FCV-43-35	ACCUM TANK SAMPLE HDR ISOL	35	
2-FCV-43-55	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL	36	
2-FCV-43-58	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL	46	
2-FCV-43-61	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL	47	
2-FCV-43-64	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL	48	
2-XX-55-6F, Train B CISP			
2-FCV-43-54D	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL	36	
2-FCV-43-56D	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL	46	
2-FCV-43-59D	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL	47	
2-FCV-43-63D	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL	48	

_____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183)

[1] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches:

A. 2-FCV-1-14 as indicated on 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, [2-M-4]:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. 2-FCV-1-32 as indicated on 2-HS-1-32/184, SG 4 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

NOTES

1) The following step will simulate AFWPT Trip & Throttle Valve being half open (TD AFWP in service) by deenergizing relay AFC on 2-R-75.
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR A & B), if Open and in Auto, will close as a result of this step.
3) 2-FCV-1-7 and 2-FCV-1-25, if OPEN, will Close as a result of this step.

[2] **REMOVE** fuse 2-FU-275-R75/M13 [2-R-75] (Drawing 2-45N2690-2).

_____ 1st

_____ CV

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[3] **VERFIY** the following: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

[4] **OPEN** 2-FCV-1-14 using 2-HS-1-14/182, SG 2 BLOWDOWN VLVS. _____

[5] **OPEN** 2-FCV-1-32 using 2-HS-1-32/184, SG 4 BLOWDOWN VLVS. _____

[6] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

NOTE

The following step will simulate reception of a Train A Accident start signal to the motor driven AFW pumps (simulation of relay RA1 [2-R-73] energizing).

[7] **PLACE** TS-R73-RA1 [2-R-73] to ON (switch CLOSED), **AND**

VERIFY the following:(**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

[8] **OPEN** 2-FCV-1-14 using 2-HS-1-14/182, SG 2 BLOWDOWN VLVS. _____

[9] **OPEN** 2-FCV-1-32 using 2-HS-1-32/184, SG 4 BLOWDOWN VLVS. _____

[10] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[11] **PLACE** TS-R73-RA1 to OFF (switch OPEN) _____

NOTE

During the removal of the simulated TD AFWP Trip & Throttle valve half open signal, there may be a momentary interruption to the RL 7 & RL 8 relays which may result in 2-FCV-1-14 & 2-FCV-1-32 going closed.

[12] **INSTALL** fuse 2-FU-275-R75/M13 _____ 1st _____ CV

[13] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches

A. 2-FCV-1-14 as indicated on 2-HS-1-14/182 SG 2 BLOWDOWN VLVS

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. 2-FCV-1-32 as indicated on 2-HS-1-32/184 SG 4 BLOWDOWN VLVS

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

NOTES

1) The following step will simulate Motor Driven AFWP 2A-A start by deenergizing relay BVA on 2-R-73.
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR A), if Open and in Auto, will close as a result of this step.

[14] **REMOVE** fuse 2-FU-273-R73/K21 [2-R-73] (Drawing 2-45N2688-2). _____ 1st _____ CV

[15] **VERFIY** the following: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

[16] **OPEN** 2-FCV-1-14 using 2-HS-1-14/182, SG 2 BLOWDOWN VLVS. _____

[17] **OPEN** 2-FCV-1-32 using 2-HS-1-32/184, SG 4 BLOWDOWN VLVS. _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[18] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

NOTE

The following step will simulate reception of a Train A Accident start signal to the TD AFWP (simulation of relay RA2 [2-R-73] energizing).

[19] **PLACE** TS-R73-RA2 [2-R-73] to ON (switch CLOSED), **AND**

VERIFY the following: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 ON _____
- Red Light for 2-FCV-1-14 OFF _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 ON _____
- Red Light for 2-FCV-1-32 OFF _____

[20] **OPEN** 2-FCV-1-14 using 2-HS-1-14/182, SG 2 BLOWDOWN VLVS. _____

[21] **OPEN** 2-FCV-1-32 using 2-HS-1-32/184, SG 4 BLOWDOWN VLVS. _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[22] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-32 ON _____

[23] **PLACE** TS-R73-RA2 [2-R-73] to OFF (switch OPEN). _____

NOTE

During the removal of the simulated Motor Driven AFWP 2A-A start signal, there will be a momentary interruption to the RL 7 & RL 8 relays which may result in 2-FCV-1-14 & 2-FCV-1-32 going closed.

[24] **INSTALL** fuse 2-FU-273-R73/K21 _____ 1st

_____ CV

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[25] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches

A. 2-FCV-1-14 as indicated on 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-14 OFF _____
- Red Light for 2-FCV-1-14 ON _____

B. 2-FCV-1-32 as indicated on 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-32 OFF _____
- Red Light for 2-FCV-1-132 ON _____

C. 2-FCV-1-181 as indicated on 2-HS-1-7/181, SG 1 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-181 OFF _____
- Red Light for 2-FCV-1-181 ON _____

D. 2-FCV-1-183 as indicated on 2-HS-1-25/183, SG 3 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-183 OFF _____
- Red Light for 2-FCV-1-183 ON _____

NOTES

1) The following step will simulate a Train A, Phase A Containment Isolation signal to Slave Relay 2-RLY-99-605A1-A [2-R-73].
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR A) and 2-FCV-43-23, if Open and in Auto, will close as a result of this step.

[26] **LIFT** white wire 2340VL at Panel 2-R-48, TB610, Pt. 11. (Drawing 45N2676-4)

_____ 1st

_____ CV

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[27] **VERIFY** the following on 2-XX-55-6E, Train A CISP, [2-M-6]: (**Acc Crit**)

A. Window 1, FCV-1-14, Green Light ON _____

B. Window 1, FCV-1-14, Red Light OFF _____

C. Window 2, FCV-1-32, Green Light ON _____

D. Window 2, FCV-1-32, Red Light OFF _____

[28] **LAND** wire 2340VL at Panel 2-R-48, TB610, Pt. 11. _____ 1st

_____ CV

[29] **VERIFY** the following on 2-XX-55-6E, Train A CISP: (**Acc Crit**)

A. Window 1, FCV-1-14, Green Light ON _____

B. Window 1, FCV-1-14, Red Light OFF _____

C. Window 2, FCV-1-32, Green Light ON _____

D. Window 2, FCV-1-32, Red Light OFF _____

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

NOTES

1) The following step will simulate a Train A, Phase A, Containment Isolation signal to Slave Relay 2-RLY-99-605A2-A [2-R-73].
2) The following System 43 valves, if Open and in AUTO, will close as a result of this step:
   - 2-FCV-43-3
   - 2-FCV-43-12
   - 2-FCV-43-35

[30] **LIFT** white wire 2340VL at Panel 2-R-48, TB611, Pt. 3. (Drawing 45N2676-4)

_____ 1st

_____ CV

[31] **VERIFY** the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-181 ON _____
- Red Light for 2-FCV-1-181 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-183 ON _____
- Red Light for 2-FCV-1-183 OFF _____

[32] **LAND** wire 2340VL at Panel 2-R-48, TB611, Pt. 3.

_____ 1st

_____ CV

Date _____

6.2.2 Train A Isolation Valves (2-FCV-1-14, 2-FCV-1-32, 2-FCV-1-181 &2-FCV-1-183) (continued)

[33] **VERIFY** the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-181 ON _____
- Red Light for 2-FCV-1-181 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-183 ON _____
- Red Light for 2-FCV-1-183 OFF _____

[34] **REMOVE** switched jumpers at the following locations:

[34.1] LABELED TS-R73-RA1:
In Panel 2-R-73, at relay RA1 (row/column A6), wires labeled G5-3 & G5-4 (relay contacts 15 & 16)
(Drawing 2-45N2688-1)

_____ 1st

_____ CV

[34.2] LABELED TS-R73-RA2:
In Panel 2-R-73, at relay RA2(row/column G5), across wires labeled K19-2 & B3-2 (relay contacts 3 & 4).
(Drawing 2-45N2688-2)

_____ 1st

_____ CV

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184)

[1] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches

A. 2-FCV-1-7 as indicated on 2-HS-1-7/181, SG 1 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. 2-FCV-1-25 as indicated on 2-HS-1-25/183, SG 3 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

NOTES

1) The following step will simulate TD AFWP Trip & Throttle Valve being half open (TD AFW in service) by deenergizing relay AFC on 2-R-75.
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR A & B), if Open and in Auto, will close as a result of this step.
3) 2-FCV-1-14 and 2-FCV-15-32, if OPEN, will close as a result of this step.

[2] **REMOVE** fuse 2-FU-275-R75/M13 [2-R-75] (Drawing 2-45N2690-2).

_____ 1st

_____ CV

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[3] **VERFIY** the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

[4] **OPEN** 2-FCV-1-7 using 2-HS-1-7/181, SG 1 BLOWDOWN VLVS. _____

[5] **OPEN** 2-FCV-1-25 using 2-HS-1-25/183, SG 3 BLOWDOWN VLVS. _____

[6] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

NOTE

The following step will simulate reception of a Train B Accident start signal to the motor driven AFW pumps (simulation of relay RB1 [2-R-78] energizing).

[7] **PLACE** TS-R78-RB1 [2-R-78] to ON (switch CLOSED), **AND**

VERIFY the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

[8] **OPEN** 2-FCV-1-7 using 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, _____

[9] **OPEN** 2-FCV-1-25 using 2-HS-1-25/183, SG 3 BLOWDOWN VLVS. _____

[10] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[11] **PLACE** TS-R78-RB1 to OFF (switch OPEN). _____

NOTE

During the removal of the simulated TD AFWP Trip & Throttle valve half open signal, there will be a momentary interruption to the RL 5 & RL 6 relays which may result in 2-FCV-1-7 & 2-FCV-1-25 going closed.

[12] **INSTALL** fuse 2-FU-275-R75/M13. _____ 1st _____ CV

[13] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches:

A. 2-FCV-1-7 as indicated on 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. 2-FCV-1-25 as indicated on 2-HS-1-25/183, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

NOTES

1) The following step will simulate Motor Driven AFWP 2B-B start by deenergizing relay BVB on 2-R-78.
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR B), if Open and in Auto, will close as a result of this step.

[14] **REMOVE** fuse 2-FU-278-R78/K23 [2-R-78] (Drawing 2-45N2693-2).

_____ 1st

_____ CV

[15] **VERFIY** the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

[16] **OPEN** 2-FCV-1-7 using 2-HS-1-7/181, SG 1 BLOWDOWN VLVS. _____

[17] **OPEN** 2-FCV-1-25 using 2-HS-1-25/183, SG 3 BLOWDOWN VLVS. _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[18] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

NOTE

The following step will simulate reception of a Train B Accident start signal to the TD AFWP (simulation of relay RB2 [2-R-78] energizing).

[19] **PLACE** TS-R78-RB2 [2-R-78] to ON (switch CLOSED), **AND**

VERIFY the following: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 ON _____
- Red Light for 2-FCV-1-7 OFF _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 ON _____
- Red Light for 2-FCV-1-25 OFF _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[20] **OPEN** 2-FCV-1-7 using 2-HS-1-7/181, SG 1 BLOWDOWN VLVS. _____

[21] **OPEN** 2-FCV-1-25 using 2-HS-1-25/183, SG 3 BLOWDOWN VLVS. _____

[22] **VERIFY** the following after each handswitch spring returns to A-P AUTO: (**Acc Crit**)

A. On 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. On 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

[23] **PLACE** TS-R78-RB2 to OFF (switch OPEN). _____

NOTE

During the removal of the simulated Motor Driven AFWP 2B-B start signal, there will be a momentary interruption to the RL 5 & RL 6 relays which may result in 2-FCV-1-7 & 2-FCV-1-25 going closed.

[24] **INSTALL** fuse 2-FU-278-R78/K23 [2-R-78]. _____ 1st _____ CV

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[25] **ENSURE** the following valves are OPEN, as indicated by the status lights on their respective handswitches:

A. 2-FCV-1-7 as indicated on 2-HS-1-7/181, SG 1 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-7 OFF _____
- Red Light for 2-FCV-1-7 ON _____

B. 2-FCV-1-25 as indicated on 2-HS-1-25/183, SG 3 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-25 OFF _____
- Red Light for 2-FCV-1-25 ON _____

C. 2-FCV-1-182 as indicated on 2-HS-1-14/182, SG 2 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-182 OFF _____
- Red Light for 2-FCV-1-182 ON _____

D. 2-FCV-1-184 as indicated on 2-HS-1-32/184, SG 4 BLOWDOWN VLVS [2-M-4]:

- Green Light for 2-FCV-1-184 OFF _____
- Red Light for 2-FCV-1-184 ON _____

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

NOTES

1) The following step will simulate a Train B, Phase A Containment Isolation signal to Slave Relay 2-RLY-99-605B2-B [2-R-51].
2) System 43 Steam Gen Drum/Blowdown Sample Isolation Valves (TR B), if open and in auto, will close as a result of this step.

[26] **LIFT** black wire 2435VL at Panel 2-R-51, TB611, Pt. 3. (Drawing 45N2677-4)

_____ 1st

_____ CV

[27] **VERIFY** the following: (**Acc Crit**)

A. On 2-XX-55-6F, Train B CISP, [2-M-6]:

- Window 3, FCV-1-7, Green Light ON _____
- Window 3, FCV-1-7, Red Light OFF _____
- Window 4, FCV-1-25, Green Light ON _____
- Window 4, FCV-1-25, Red Light OFF _____

B. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-182 ON _____
- Red Light for 2-FCV-1-182 OFF _____

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-184 ON _____
- Red Light for 2-FCV-1-184 OFF _____

[28] **LAND** black 2435VL at Panel 2-R-51, TB611, Pt. 3.

_____ 1st

_____ CV

Date _____

6.2.3 Train B Isolation Valves (2-FCV-1-7, 2-FCV-1-25, 2-FCV-1-182 & 2-FCV-1-184) (continued)

[29] **VERIFY** the following: (**Acc Crit**)

A. On 2-XX-55-6F, Train B CISP, [2-M-6]:

- Window 3, FCV-1-7, Green Light ON _____
- Window 3, FCV-1-7, Red Light OFF _____
- Window 4, FCV-1-25, Green Light ON _____
- Window 4, FCV-1-25, Red Light OFF _____

B. On 2-HS-1-14/182, SG 2 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-182 ON _____
- Red Light for 2-FCV-1-182 OFF _____

C. On 2-HS-1-32/184, SG 4 BLOWDOWN VLVS:

- Green Light for 2-FCV-1-184 ON _____
- Red Light for 2-FCV-1-184 OFF _____

[30] **REMOVE** switched jumpers at the following locations:

[30.1] LABELED TS-R78-RB1:
In Panel 2-R-78, at relay RB1 (row/column A6), across wires labeled H7-3 & H7-4 (relay contacts 15 & 16). (Drawing 2-45N2693-1)

_____ 1st

_____ CV

[30.2] LABELED TS-R78-RB2:
In Panel 2-R-78, at relay RB2 (row/column H7), across wires labeled K9-2 & J6-2 (relay contacts 3 & 4) (Drawing 2-45N2693-2)

_____ 1st

_____ CV

Date _____

6.2.4 Automatic Controls Restoration

NOTES

1) Current Position will be based on the on the CISP indication. Record as follows:
   - OPEN for Red light only ON
   - CLOSED for Green Light Only ON.
2) N/A Steps 6.2.4[1] and 6.2.4[2] if step 6.2.1[4] was N/A'd.

[1] **RECORD** position information for the following valves:

Valve	Window	As-Found Position (from 6.2.1[4])	Current Position
2-XX-55-6E, Train A CISP			
2-FCV-43-3	32		
2-FCV-43-12	33		
2-FCV-43-23	34		
2-FCV-43-35	35		
2-FCV-43-55	36		
2-FCV-43-58	46		
2-FCV-43-61	47		
2-FCV-43-64	48		
2-XX-55-6F, Train B CISP			
2-FCV-43-54D	36		
2-FCV-43-56D	46		
2-FCV-43-59D	47		
2-FCV-43-63D	48		

_____

Date _____

6.2.4 Automatic Controls Restoration (continued)

[2] **ENSURE** the following valves are returned to their "As-Found Position":

Valve	Handswitch	Description	1st	CV
JB 2014 A11W/713				
2-FCV-43-3	2-HS-43-3	PRESSURIZER GAS SAMPLE ISOL		
2-FCV-43-12	2-HS-43-12	PRESSURIZER LIQUID SAMPLE ISOL		
2-FCV-43-23	2-HS-43-23	HOT LEGS 1/3 SAMPLE ISOL		
2-FCV-43-35	2-HS-43-35	ACCUM TANK SAMPLE HDR ISOL		
JB 2283 A8W/713				
2-FCV-43-55	2-HS-43-55	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-58	2-HS-43-58	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-61	2-HS-43-61	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-64	2-HS-43-64	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL		
JB 4262 A9V/713				
2-FCV-43-54D	2-HS-43-54D	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-56D	2-HS-43-56D	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-59D	2-HS-43-59D	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL		
2-FCV-43-63D	2-HS-43-63D	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL		

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic

NOTE

2-HS-15-44 is a keyed switch which is maintained in all positions (CLOSE, AUTO & OPEN). The key is required for all HS manipulations.

[1] **ENSURE** prerequisites listed in Section 4.0 for Section 6.3 have been completed. _____

[2] **VERIFY** the following:

A. 2-FCV-15-44, SG BLOWDOWN DISCH TO CTBD [T15J/708], is CLOSED (locally). _____

B. On 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD [2-JB-291-1775, T11J/708]:

- GREEN Light ON _____
- RED Light OFF _____

C. 2-XA-55-3C–62F, SG BLOWDOWN DISCH TO CTBD CLOSED, is in ALARM. _____

[3] **PLACE** TS-M12-KIR [0-M-12] to ON (switch CLOSED). _____

[4] **PLACE** TS-R71-XY [2-R-71] to ON (switch CLOSED). _____

[5] **PLACE** 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD, to OPEN. _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

CAUTION

The following step will open 2-FCV-15-44. U2 SGBD could become pressurized and heated if U1 SGBD is in service with flow routed to CTBD and 2-CKV-15-882 leaks by.

[6] **SLOWLY INCREASE** the manual knob on 2-FC-15-44, SG BLOWDOWN FLOW CONTROL [2-L-657, T14J/708], until the controller output scale reads 100%, **AND**

VERIFY the following: (**Acc Crit**)

A. 2-FCV-15-44, SG BLOWDOWN DISCH TO CTBD [T8J/708], is OPEN (locally). _____

B. At 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD:

- GREEN Light OFF _____
- RED Light ON _____

C. 2-XA-55-3C–62F SG BLOWDOWN DISCH TO CTBD CLOSED, is CLEAR. _____

D. Unit 2 Alarm Events Display Screen indicates 62-F, SG BLOWDOWN DISCH TO CTBD CLOSED (FCV-15-44), is NORMAL (Green). _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

NOTE

Steps 6.3[7] through 6.3[17] will open and close 2-FCV-15-44. 2-XA-55-3C–62F will alarm each time the valve is closed.

[7] **PLACE** 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD to CLOSE, **AND**

VERIFY the following: (**Acc Crit**)

A. On 2-HS-15-44:

- GREEN Light ON _____
- RED Light OFF _____

B. 2-XA-55-3C–62F, SG BLOWDOWN DISCH TO CTBD CLOSED, ALARMS. _____

C. Unit 2 Alarm Events Display Screen indicates 62-F, SG BLOWDOWN DISCH TO CTBD CLOSED (FCV-15-44), is in ALARM (Red). _____

[8] **PLACE** 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD, to AUTO, **AND**

VERIFY the following on 2-HS-15-44:

A. GREEN Light OFF _____

B. RED Light ON _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

NOTE

The following step will simulate high radiation level in the SGBD discharge line.

[9] **PLACE** TS-M12-KIR [0-M-12] to OFF (switch OPEN), **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD: (**Acc Crit**).

A. GREEN Light ON _____

B. RED Light OFF _____

[10] **PLACE** TS-M12-KIR [0-M-12] to ON (switch CLOSED), **AND**

VERIFY the following on 2-HS-15-44:

A. GREEN Light OFF _____

B. RED Light ON _____

NOTE

The following step will simulate low flow at CCW diffuser outlets (low cooling tower blowdown to the river).

[11] **PLACE** TS-R71-XY to OFF (switch OPEN), **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD: (**Acc Crit**)

A. GREEN Light ON _____

B. RED Light OFF _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

[12] **PLACE** 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD, to OPEN, **AND**

VERIFY the following on 2-HS-15-44: (**Acc Crit**)

A. GREEN Light OFF _____

B. RED Light ON _____

[13] **PLACE** TS-M12-KIR [0-M-12] to OFF (switch OPEN), **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD: (**Acc Crit**)

A. GREEN Light ON _____

B. RED Light OFF _____

[14] **PLACE** 2-HS-90-120A [0-M-12], STM GEN BLDN RAD MON SIG BLOCK, to 2-120/121, **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD: (**Acc Crit**)

A. GREEN Light OFF _____

B. RED Light ON _____

[15] **PLACE** 2-HS-90-120A, STM GEN BLDN RAD MON SIG BLOCK, to OFF, **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD:

A. GREEN Light ON _____

B. RED Light OFF _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

[16] **PLACE** 2-HS-90-120A, STM GEN BLDN RAD MON SIG BLOCK, to 2-120/121, **AND**

VERIFY the following on 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD:

A. GREEN Light OFF _____

B. RED Light ON _____

NOTES

1) Steps 6.3[17] and 6.3[18] involve local and remote stroke timing (Open to Close) of 2-FCV-15-44.
2) Local stroke time begins once 2-HS-15-44 is placed to CLOSE and concludes with the completion of valve stem movement.
3) Remote stroke timing begins once 2-HS-15-44 is placed to CLOSE and concludes when only the green status light is ON at 2-HS-15-44.

[17] **PLACE** 2-HS-15-44, SG BLOWDOWN DISCH TO CTBD, to CLOSE, **AND**

MEASURE the stroke CLOSE time of 2-FCV-15-44, SG BLOWDOWN DISCH TO CTBD

A. Locally _____

B. Remotely _____

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

[18] **RECORD** the stroke CLOSE times of 2-FCV-15-44, SG BLOWDOWN DISCH TO CTB, **AND**

VERIFY they meet Acceptance Criteria.

A. Local Stroke CLOSE time:

_____ seconds M&TE: _____

Acc Crit: 2.0 < Time < 5.0 seconds

_____

B. Remote stroke CLOSE time:

_____ seconds M&TE: _____

Acc Crit: 2.0 < Time < 5.0 seconds

_____

[19] **DECREASE** the manual knob on 2-FC-15-44, SG BLOWDOWN FLOW CONTROL, until controller output scale reads 0%. _____

[20] **PLACE** 2-HS-90-120A, STM GEN BLDN RAD MON SIG BLOCK, to OFF. _____

[21] **REMOVE** switched jumpers at the following locations:

[21.1] LABELED TS-M12-KIR:
In Panel 0-M-12, at TB2-2B, across wires KIRX & KIRI (Pts. 1 & 2). (Drawing 45N1651-14)

_____ 1st

_____ CV

[21.2] LABELED TS-R71-XY:
In Panel 2-R-71, at TB130, across wires BLW10 (W, lifted from Pt. 3) & BLW11 (BK, Pt. 2). (Drawing 45N2686-4)

_____ 1st

_____ CV

Date _____

6.3 2-FCV-15-44, SGBD discharge to CTBD Logic (continued)

[22] **LAND** white wire BLW10 at Pt. 3 of TB130 in 2-R-71. (Drawing 45N2686-4)

_____
1st

_____
CV

Date _____

6.4 2-FCV-15-43, SGBD Flow Control Logic

NOTES

1) 2-FCV-15-43 has no associated handswitch. It is manually controlled by 2-HIC-15-43.
2) 2-FCV-15-43 has no limit switch related position indication. Valve position will be determined by valve stem observation.

[1] **ENSURE** prerequisites listed in Section 4.0 for Section 6.4 have been completed. _____

[2] **VERIFY** 2-FCV-15-43, SG BLOWDOW FLOW CONTROL, is CLOSED [T11J/708]. _____

[3] **ADJUST** Thermocouple Test Set/Calibrator [2-L-164 T11J/712] signal source to approximately 0mV output. _____

NOTE

The following step will simulate normal (NOT low) flow through the Condenser Hotwell Pump Discharge Header.

[4] **PLACE** TS-L309-FS35 [2-L-309, T14H/685.5], to ON (switch CLOSED). _____

[5] **INCREASE** 2-HIC-15-43, STM GEN BLOWDOWN FLOW CONTROL [2-M-4], setpoint until controller output scale reads 100%, **AND**

VERIFY 2-FCV-15-43, SG BLOWDOW FLOW CONTROL OPENS. (**Acc Crit**) _____

[6] **ENSURE** 2-XA-55-3C–61F, SG BLOWDOWN TEMP HI, is CLEAR. _____

Date _____

6.4 2-FCV-15-43, SGBD Flow Control Logic (continued)

NOTE

The following step will simulate a high temperature in the SGBD 1st stage HTX discharge line.

[7] **ADJUST** Thermocouple Test Set/Calibrator [2-L-164 T11J/712] signal source to greater than 3mV output **AND**

VERIFY the following:

A. 2-FCV-15-43, SG BLOWDOWN FLOW CONTROL, CLOSES. (**Acc Crit**) _____

B. 2-XA-55-3C–61F, SG BLOWDOWN TEMP HI, ALARMS. _____

C. Unit 2 Alarm Events Display Screen indicates 61-F, SG BLOWDOWN TEMP HI (TS-15-43A/B), is in ALARM (Red). _____

[8] **ADJUST** Thermocouple Test Set/Calibrator signal source to less than 2mV output **AND**

VERIFY the following:

A. 2-FCV-15-43, SG BLOWDOWN FLOW CONTROL, OPENS. (**Acc Crit**) _____

B. 2-XA-55-3C–61F, SG BLOWDOWN TEMP HI, is CLEAR. _____

C. Unit 2 Alarm Events Display Screen indicates 61-F, SG BLOWDOWN TEMP HI (TS-15-43A/B), is NORMAL (Green). _____

Date _____

6.4 2-FCV-15-43, SGBD Flow Control Logic (continued)

NOTE

The following step will simulate low flow through the Condenser Hotwell Pump Discharge Header.

[9] **PLACE** TS-L309-FS35, to OFF (switch OPEN), **AND**

VERIFY, that 2-FCV-15-43, SG BLOWDOWN FLOW CONTROL, CLOSES. (**Acc Crit**) _____

[10] **PLACE** TS-L309-FS35 [2-L-309, T14H/685.5], to ON (switch CLOSED), **AND**

VERIFY, that 2-FCV-15-43, SG BLOWDOWN FLOW CONTROL, OPENS. (**Acc Crit**) _____

[11] **PLACE** TS-L309-FS35, to OFF (switch OPEN) _____

[12] **DECREASE** 2-HIC-15-43, STM GEN BLOWDOWN FLOW CONTROL, setpoint until controller output scale reads 0%. _____

[13] **REMOVE** the following switched jumper:
LABELED TS-L309-FS35
In Panel 2-L-309, at 2-FS-2-35, across lifted wire BLWX (lifted from Pt. 6) and wire BLW8 (Pt. 7).
(Drawing 2-45N2635-53)

_____ 1st

_____ CV

[14] **LAND** wire BLWX at Terminal Pt. 6 of 2-FS-2-35 in 2-L-309. (Drawing 2-45N2635-53)

_____ 1st

_____ CV

Date _____

6.4 2-FCV-15-43, SGBD Flow Control Logic (continued)

[15] **REMOVE** Thermocouple Test Set/Calibrator per the following instructions at 2-TS-15-43 (Drawing 45N2635-66):

A. **LIFT** negative test lead from Pt 1. _____ 1st _____ CV

B. **LIFT** positive test lead from Pt 2. _____ 1st _____ CV

C. **LAND** the negative thermocouple wire (R) at Pt 1. _____ 1st _____ CV

D. **LAND** the positive thermocouple wire (BL) at Pt 2. _____ 1st _____ CV

Date _____

6.5 System Performance Test at the RCS 250°F Plateau

6.5.1 Preliminary Actions

[1] **VERIFY** U2 Reactor Coolant System is at the 250°F Plateau, in accordance with 2-PTI-068-01 _____

[2] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. _____

[3] **OPEN** the following drain valves to enable pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN [T10J/708]. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN [T10G/708]. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN [T15H/708]. _____

Date _____

6.5.2 SGBD from HTXs to Cooling Tower Blowdown

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of 2-TOP-015-01. 262 gpm shall not be exceeded.

[1] **ENSURE** SGBD is in service to Cooling Tower Blowdown, in accordance with 2-TOP-015-01, or equivalent, with maximum obtainable flow rate (up to 262 gpm). _____

[2] **OPERATE** the system for a minimum of 10 minutes. _____

[3] **RECORD** the required information on Data Sheet 1. _____

[4] **VERIFY** the following (from Data Sheet 1): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

[5] **CLOSE** the following drain valves to isolate pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN. _____

Date _____

6.5.2 SGBD from HTXs to Cooling Tower Blowdown (continued)

[6] **NOTIFY** the Operations Department that SGBD testing at the 250°F Plateau is complete, **AND**

RECORD the SGBD destination and flow rate required by the Operations and Chemistry Departments below.

SGBD Destination	
SGBD Flow Rate	

[7] **ENSURE** the SGBD system is aligned to the discharge flow path recorded in Step 6.5.2[6], using the appropriate section of 2-TOP-015-01. _____

NOTES

1) Steps 6.5.2[8] and 6.5.2[9] shall be N/A'd if SGBD was shutdown in Step 6.5.2[7].
2) Steps 6.5.2[8] and 6.5.2[9] may be performed concurrently, if necessary to meet the below requirements.

[8] **PERFORM** Section 8.2 of 2-TOP-015-01 to adjust SGBD flow rate to the flow rate recorded in Step 6.5.2[6]. _____

[9] **PERFORM** Section 8.1 of 2-TOP-015-01 to rebalance individual Steam Generator's blowdown flow rates to within 5 gpm of each other or per Chemistry requirements. _____

Date _____

6.6 System Performance Test at the RCS 350°F Plateau

6.6.1 Preliminary Actions

[1] **VERIFY** U2 Reactor Coolant System is at the 350°F Plateau, in accordance with 2-PTI-068-01 _____

[2] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. _____

[3] **OPEN** the following drain valves to enable pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN [T10J/708]. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN [T10G/708]. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN [T15H/708]. _____

Date _____

6.6.2 SGBD from HTXs to Cooling Tower Blowdown

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of 2-TOP-015-01. 262 gpm shall not be exceeded

[1] **ENSURE** SGBD is in service to Cooling Tower Blowdown, in accordance with 2-TOP-015-01, or equivalent, with maximum obtainable flow rate (up to 262 gpm). _____

[2] **NOTIFY** Test Engineer responsible for 2-PTI-999-01 that system conditions have been established for steady state vibration data collection. _____

[3] **OPERATE** the system for a minimum of 10 minutes. _____

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Steps 6.6.2[4] and 6.6.2[5] may be performed concurrently.

[4] **WALKDOWN** the accessible portions of the SGBD System, in the Turbine Building, **AND**

VERIFY the steady state piping and component vibration is acceptable. _____

[5] **RECORD** the required information on Data Sheet 2 _____

[6] **VERIFY** the following (from Data Sheet 2): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

Date _____

6.6.2 SGBD from HTXs to Cooling Tower Blowdown (continued)

[7] **CLOSE** the following drain valves to isolate pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN. _____

[8] **ENSURE** the SDBD vibration testing, performed at the 350°F Plateau in 2-PTI-999-01, is complete. _____

[9] **NOTIFY** the Operations Department that SGBD testing at the 350°F Plateau is complete, **AND**

RECORD the SGBD destination and flow rate required by the Operations and Chemistry Departments below.

SGBD Destination	
SGBD Flow Rate	

[10] **ENSURE** the SGBD system is aligned to the discharge flow path recorded in Step 6.6.2[9], using the appropriate section of 2-TOP-015-01. _____

NOTES

1) Steps 6.6.2[11] and 6.6.2[12] shall be N/A's if SGBD was shutdown in Step 6.6.2[10] or if the current flow rates meet the below requirements.
2) Steps 6.6.2[11] and 6.6.2[12] may be performed concurrently, if necessary to meet the below requirements.

[11] **PERFORM** Section 8.2 of 2-TOP-015-01 to adjust SGBD flow rate to the flow rate recorded in Step 6.6.2[9]. _____

[12] **PERFORM** Section 8.1 of 2-TOP-015-01 to rebalance individual Steam Generator's blowdown flow rates to within 5 gpm of each other or per Chemistry requirements. _____

Date _____

6.7 System Performance Test at the RCS 450°F Plateau

6.7.1 Preliminary Actions

NOTE

Subsections 6.7.2 and 6.7.3 may be performed out of order.

[1] **VERIFY** U2 Reactor Coolant System is at the 450°F Plateau, in accordance with 2-PTI-068-01 _____

[2] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. _____

[3] **OPEN** the following drain valves to enable pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN [T10J/708]. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN [T10G/708]. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN [T15H/708]. _____

Date _____

6.7.2 SGBD from HTXs to Condensate Demineralizer

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of the 2-TOP-015-01.

[1] **ENSURE** SGBD is in service to Condensate Demineralizer, in accordance with 2-TOP-015-01, or equivalent, with maximum obtainable flow rate (up to approximately 360 gpm). _____

[2] **NOTIFY** Test Engineer responsible for 2-PTI-999-01 that system conditions have been established for steady state vibration data collection. _____

[3] **OPERATE** the system for a minimum of 10 minutes. _____

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Steps 6.7.2[4] and 6.7.2[5] may be performed concurrently.

[4] **WALKDOWN** the accessible portions of the SGBD System, in the Turbine Building, **AND**

VERIFY the steady state piping and component vibration is acceptable. _____

[5] **RECORD** the required information on Data Sheet 3. _____

[6] **VERIFY** the following (from Data Sheet 3): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

Date _____

6.7.2 SGBD from HTXs to Condensate Demineralizer (continued)

[7] **ENSURE** the 2-PTI-999-01 SDBD vibration testing, performed at the 450°F Plateau, with discharge routed to Condensate Demineralizer, is complete. _____

Date _____

6.7.3 SGBD from HTXs to Cooling Tower Blowdown

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of 2-TOP-015-01. 262 gpm shall not be exceeded.

[1] **ENSURE** SGBD is in service to Cooling Tower Blowdown, in accordance with 2-TOP-015-01, or equivalent, with maximum obtainable flow rate (up to 262 gpm). _____

[2] **NOTIFY** Test Engineer responsible for 2-PTI-999-01 that system conditions have been established for steady state vibration data collection. _____

[3] **OPERATE** the system for a minimum of 10 minutes. _____

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Steps 6.7.3[4] and 6.7.3[5] may be performed concurrently.

[4] **WALKDOWN** the accessible portions of the SGBD System, in the Turbine Building, **AND**

VERIFY the steady state piping and component vibration is acceptable. _____

[5] **RECORD** the required information on Data Sheet 4. _____

[6] **VERIFY** the following (from Data Sheet 4): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

Date _____

6.7.3 SGBD from HTXs to Cooling Tower Blowdown (continued)

[7] **ENSURE** the 2-PTI-999-01 SDBD vibration testing, performed at the 450°F Plateau, with discharge routed to CTBD, is complete. _____

Date _____

6.7.4 450°F Plateau Restoration

[1] **CLOSE** the following drain valves to isolate pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN. _____

[2] **NOTIFY** the Operations Department that SGBD testing at the 450°F Plateau is complete, **AND**

RECORD the SGBD destination and flow rate required by the Operations and Chemistry Departments below.

SGBD Destination	
SGBD Flow Rate	

[3] **ENSURE** the SGBD system is aligned to the discharge flow path recorded in Step 6.7.4[2], using the appropriate section of 2-TOP-015-01. _____

NOTES

1) Steps 6.7.4[4] and 6.7.4[5] shall be N/A's if SGBD was shutdown in Step 6.7.4[3] or if the current flow rates meet the below requirements.
2) Steps 6.7.4[4] and 6.7.4[5] may be performed concurrently to meet the below requirements.

[4] **PERFORM** Section 8.2 of 2-TOP-015-01 to adjust SGBD flow rate to the flow rate recorded in Step 6.7.4[2] _____

[5] **PERFORM** Section 8.1 of 2-TOP-015-01 to rebalance individual Steam Generator's blowdown flow rates to within 5 gpm of each other or per Chemistry requirements. _____

Date _____

6.8 System Performance Test at the RCS 557°F Plateau

6.8.1 Preliminary Actions

NOTE
Subsections 6.8.2 and 6.8.3 may be performed out of order.

[1] **VERIFY** U2 Reactor Coolant System is at the 557°F Plateau, in accordance with 2-PTI-068-01 _____

[2] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. _____

[3] **OPEN** the following drain valves to enable pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN [T10J/708]. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN [T10G/708]. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN [T15H/708]. _____

Date _____

6.8.2 SGBD from HTXs to Condensate Demineralizer

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of the 2-TOP-015-01.

[1] **ENSURE** SGBD is in service to Condensate Demineralizer, in accordance with 2-TOP-015-01, or equivalent, with SGBD Total Flow (ICS Point U0564)≥360gpm or at maximum obtainable flowrate. _____

[2] **NOTIFY** Test Engineer responsible for 2-PTI-999-01 that system conditions have been established for steady state vibration data collection. _____

[3] **OPERATE** the system for a minimum of 10 minutes. _____

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Steps 6.8.2[4] and 6.8.2[5] may be performed concurrently.

[4] **WALKDOWN** the accessible portions of the SGBD System, in the Turbine Building, **AND**

VERIFY the steady state piping and component vibration is acceptable. _____

[5] **RECORD** the required information on Data Sheet 5. _____

[6] **VERIFY** the following (from Data Sheet 5): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

D. SGBD Total Flow (ICS Point U0564)≥360gpm _____

Date _____

6.8.2 SGBD from HTXs to Condensate Demineralizer (continued)

[7] **ENSURE** the 2-PTI-999-01 SDBD vibration testing, performed at the 557°F Plateau, with discharge routed to Condensate Demineralizer, is complete. _____

Date _____

6.8.3 SGBD from HTXs to Cooling Tower Blowdown

NOTE

Maximum flow would be obtained by taking 2-FCV-15-43 to full open and the four SGBD throttle valves to full open during performance of 2-TOP-015-01. 262 gpm shall not be exceeded.

[1] **ENSURE** SGBD is in service to Cooling Tower Blowdown, in accordance with 2-TOP-015-01, or equivalent, with maximum obtainable flow rate (up to 262 gpm). _____

[2] **NOTIFY** Test Engineer responsible for 2-PTI-999-01 that system conditions have been established for steady state vibration data collection. _____

[3] **OPERATE** the system for a minimum of 10 minutes. _____

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Steps 6.8.3[4] and 6.8.3[5] may be performed concurrently.

[4] **WALKDOWN** the accessible portions of the SGBD System, in the Turbine Building, **AND**

VERIFY the steady state piping and component vibration is acceptable. _____

[5] **RECORD** the required information on Data Sheet 6. _____

[6] **VERIFY** the following (from Data Sheet 6): (**Acc Crit**)

A. 1st Stage HTX SGBD Outlet Temp (2-TIS-15-42)≤166°F. _____

B. 1st Stage HTX Condenesate Outlet Temp (2-TIC-2-329A)≤224°F. _____

C. 2nd Stage HTX SGBD Outlet Temp (2-TE-15-43)≤140°F. _____

Date _____

6.8.3 SGBD from HTXs to Cooling Tower Blowdown (continued)

[7] **ENSURE** the 2-PTI-999-01 SDBD vibration testing, performed at the 557°F Plateau, with discharge routed to CTBD, is complete. _____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time

NOTES

1) The maximum rate of change of blowdown flow shall not exceed 50 gpm per minute.
2) The throttle valves in Step 6.8.4[1] should be closed, iteratively, approximately one handwheel turn at a time.

[1] **ADJUST** the following throttle valves to approximately 1 handwheel turn open:

A. 2-THV-1-828, BLWDN THROT LOOP 1 [740/A14U SVVR]. _____

B. 2-THV-1-829, BLWDN THROT LOOP 2 [740/A14U SVVR]. _____

C. 2-THV-1-830, BLWDN THROT LOOP 3 [740/A14U SVVR]. _____

D. 2-THV-1-831, BLWDN THROT LOOP 4 [740/A14U SVVR]. _____

NOTES

1) Steps 6.8.4[2] and 6.8.4[3] may be N/A'd if the current SGBD flow rates meet the below requirements.
2) Steps 6.8.4[2] and 6.8.4[3] may be performed concurrently, if necessary to meet the below requirements.

[2] **PERFORM** Section 8.2 of 2-TOP-015-01 to adjust SGBD flow rate to approximately 50 gpm or to Operations/Chemistry requirements. _____

[3] **PERFORM** Section 8.1 of 2-TOP-015-01 to rebalance individual Steam Generator's blowdown flow rates to within 5 gpm of each other or per Chemistry requirements. _____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

NOTE

Steps 6.8.4[4] and 6.8.4[5] may be performed concurrently with the remaining steps in Section 6.8.

[4] **REQUEST** the Chemistry Department to sample the SGBD system, in accordance with CM-6.61, or equivalent. _____

[5] **RECORD** the results below, **AND**

VERIFY they meet acceptance criteria:

Parameter	Acceptance Criteria	Sample Value	
Cation Conductivity	≤2.0μS/cm @ 25°C		_____
Sodium	≤50ppb		_____
Chloride	≤50ppb		_____
Sulfate	≤50ppb		_____
Hydrazine	>2.5ppb		_____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

NOTES

1) Steps 6.8.4[6] through 6.8.4[21] involve stroke time measurement of SGBD Containment Isolation and Blowdown Isolation Valves (CIV and BIV).
2) Each Steam Generator's set of Isolation Valves are controlled by a single Handswitch. Refer to notes in Section 6.1 for additional information regarding handswitch operation.
3) Each Steam Generator's set of Isolation Valves will be stroked timed simultaneously with both Isolation Valves requiring a dedicated data recording individual and stopwatch.
4) Close stroke time measurement starts when a set of Isolation Valves' respective handswitch is placed to CLOSE and stops when only the green lights are ON. Open stroke time measurement starts when the handswitch is placed to OPEN and stops when only the red lights are on.

[6] **PLACE** 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, to CLOSE, **AND**

MEASURE the CLOSE stroke time of 2-FCV-1-7 and 2-FCV-1-181 using the stop watches. _____

[7] **RECORD** the CLOSE stroke time of each valve below, **AND**

VERIFY they meet Acceptance Criteria.

A. 2-FCV-1-7:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

B. 2-FCV-1-181:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

[8] **PLACE** 2-HS-1-7/181, SG 1 BLOWDOWN VLVS, to OPEN, **AND**

MEASURE the OPEN stroke time of 2-FCV-1-7 and 2-FCV-1-181 using the stop watches. _____

[9] **RECORD** the OPEN stroke time of each valve below.

A. 2-FCV-1-7:

_____ seconds M&TE: _____

_____

B. 2-FCV-1-181:

_____ seconds M&TE: _____

_____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

[10] **PLACE** 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, to CLOSE, **AND**

MEASURE the CLOSE stroke time of 2-FCV-1-14 and 2-FCV-1-182 using the stop watches. _____

[11] **RECORD** the CLOSE stroke time of each valve below, **AND**

VERIFY they meet Acceptance Criteria.

A. 2-FCV-1-14:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

B. 2-FCV-1-182:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

[12] **PLACE** 2-HS-1-14/182, SG 2 BLOWDOWN VLVS, to OPEN, **AND**

MEASURE the OPEN stroke time of 2-FCV-1-14 and 2-FCV-1-182 using the stop watches. _____

[13] **RECORD** the OPEN stroke time of each valve below.

A. 2-FCV-1-14:

_____ seconds M&TE: _____

_____

B. 2-FCV-1-182:

_____ seconds M&TE: _____

_____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

[14] **PLACE** 2-HS-1-25/183, SG 3 BLOWDOWN VLVS, to CLOSE, **AND**

MEASURE the CLOSE stroke time of 2-FCV-1-25 and 2-FCV-1-183 using the stop watches. _____

[15] **RECORD** the CLOSE stroke time of each valve below, and

VERIFY they meet Acceptance Criteria.

A. 2-FCV-1-25:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

B. 2-FCV-1-183:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

[16] **PLACE** 2-HS-1-25/183, SG 3 BLOWDOWN VLVS, to OPEN, **AND**

MEASURE the OPEN stroke time of 2-FCV-1-25 and 2-FCV-1-183 using the stop watches. _____

[17] **RECORD** the OPEN stroke time of each valve below.

A. 2-FCV-1-25:

_____ seconds M&TE: _____

_____

B. 2-FCV-1-183:

_____ seconds M&TE: _____

_____

Date _____

6.8.4 SGBD Containment/Blowdown Isolation Stroke Time (continued)

[18] **PLACE** 2-HS-1-32/184, SG 4 BLOWDOWN VLVS, to CLOSE, **AND**

MEASURE the CLOSE stroke time of 2-FCV-1-32 and 2-FCV-1-184 using the stop watches. _____

[19] **RECORD** the CLOSE stroke time of each valve below, **AND**

VERIFY they meet Acceptance Criteria.

A. 2-FCV-1-32:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

B. 2-FCV-1-184:

_____ seconds M&TE: _____

Acc Crit: 15.0 seconds maximum

_____

[20] **PLACE** 2-HS-1-32/184, SG 4 BLOWDOWN VLVS, to OPEN, **AND**

MEASURE the OPEN stroke time of 2-FCV-1-32 and 2-FCV-1-184 using the stop watches. _____

[21] **RECORD** the OPEN stroke time of each valve below.

A. 2-FCV-1-32:

_____ seconds M&TE: _____

_____

B. 2-FCV-1-184:

_____ seconds M&TE: _____

_____

Date _____

6.8.5 Flood Mode Operation and Restoration

[1] **ENSURE** SGBD is Shutdown in accordance with 2-TOP-015-01 or equivalent. _____

[2] **OPEN** 2-VTV-1-833, STEAM GEN BLOWDOWN HDR VENT [A15U, 740]. _____

CAUTION

Step 6.8.5[3] will release steam to the roof of the Main Steam Safety Valve room. Ensure that all personnel are clear of that area.

[3] **OPEN** 2-VTV-1-832, STEAM GEN BLOWDOWN HDR VENT, [A15U, 740 (SVVR)] until steam is observed through the vent located on the top of the Main Steam Safety Valve room. (**Acc Crit**) _____

[4] **CLOSE** 2-VTV-1-832. STEAM GEN BLOWDOWN HDR VENT. _____

[5] **CLOSE** 2-VTV-1-833, STEAM GEN BLOWDOWN HDR VENT. _____

[6] **CLOSE** the following drain valves to isolate pressure gauges installed by Step 4.3[11]:

A. 2-DRV-15-914, SG BLOWDOWN HX 1A INLET DRAIN. _____

B. 2-DRV-15-884, SG BLOWDOWN HX 1B OUTLET DRAIN. _____

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN. _____

[7] **ENSURE** the SDBD vibration testing, performed at the 557°F Plateau in 2-PTI-999-01, is complete. _____

Date _____

6.8.5 Flood Mode Operation and Restoration (continued)

[8] **NOTIFY** the Operations Department that SGBD testing at the 557°F Plateau is complete, **AND**

RECORD the SGBD destination and flow rate required by the Operations and Chemistry Departments below.

SGBD Destination	
SGBD Flow Rate	

[9] **ENSURE** the SGBD system is aligned to the discharge flow path recorded in Step 6.8.5[8], using the appropriate section of 2-TOP-015-01. _____

NOTES

1) Steps 6.8.5[10] and 6.8.5[11] shall be N/A's if SGBD was shutdown in Step 6.8.5[9] or if the current flow rates meet the below requirements.
2) Steps 6.8.5[10] and 6.8.5[11] may be performed concurrently to meet the below requirements.

[10] **PERFORM** Section 8.2 of 2-TOP-015-01 to adjust SGBD flow rate to the flow rate recorded in Step 6.8.5[8]. _____

[11] **PERFORM** Section 8.1 of 2-TOP-015-01 to rebalance individual Steam Generator's blowdown flow rates to within 5 gpm of each other or per Chemistry requirements. _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES

NOTE

Post-performance steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the end of the instruction performance.

[1] **VERIFY** that Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

RECORD the results on Measuring and Test Equipment (M&TE) Log. _____

[2] **VERIFY** that Post-test calibration of permanent plant instruments used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

RECORD the results on Appendix C, Permanent Plant Instrumentation Log. _____

[3] **VERIFY** no excessive vibration of piping and components was observed or Engineering has evaluated the vibration and found it acceptable or has initiated corrective action. _____

[4] **ENSURE** any temporary conditions recorded in Appendix B, Temporary Condition Log, are addressed for necessary restoration as applicable (N/A if no conditions recorded). _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[5] **REMOVE** 0-1500 psi gages at the following locations:

A. 2-DRV-15-914, SG BLOWDOWN HX 2A INLET DRAIN. _____ 1st _____ CV

B. 2-DRV-15-884, SG BLOWDOWN HX 2B OUTLET DRAIN. _____ 1st _____ CV

C. 2-DRV-15-889, SG BLOWDOWN HX 2 OUTLET DRAIN. _____ 1st _____ CV

[6] **REMOVE** Thermocouple Test Set/Calibrator per the following instructions at 2-TS-15-43:

A. **LIFT** negative test lead from Pt 1. _____ 1st _____ CV

B. **LIFT** positive test lead from Pt 2. _____ 1st _____ CV

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[7] **REMOVE** 0-600°F Digital Thermometer with Type T thermocouple from the following thermowells:

A. 2-TW-2-330A, SGB 2ND STAGE HX TEST WELL

_____ 1st

_____ CV

B. 2-TW-2-330B, SGB 2ND STAGE HX TEST WELL

_____ 1st

_____ CV

C. 2-TW-2-329B, SGB 1ST STAGE HX TEST WELL [T10G/708]

_____ 1st

_____ CV

[8] **NOTIFY** the Unit 2 US/SRO/SM of the test completion and system alignment. _____

[9] **NOTIFY** the Unit 1 US/SRO/SM of the test completion and system alignment.

8.0 RECORDS

A. QA Records

Completed Test Data Package

B. Non-QA Records

None

Appendix A
(Page 1 of 1)
TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
U2 FSAR - Amendment 109 Section 10.3.5 Section 10.4.8 Table 14.2-1 Sh 66 of 89			
WBN2-15-4002, Rev 1			
WBN2-1-4002, Rev 3			
2-TSD-15-1, Rev 0			
2-TSD-88-5, Rev 1			
SOI-15.01[1], Rev 60			
Chemistry Manual Chapter 3.01, Rev 86			
SSD-1-LPF-15-44[1], Rev 3			
SSD-1-LPF-15-43[1], Rev 6			
SSD-2-LPT-2-329A Rev 0			
NE SSD 2-F-152, Rev 0			
NE SSD 2-F-152, Rev 0			
NE SSD 2-F-152, Rev 0			
NE SSD 2-F-152, Rev 0			

[1] To be Reviewed against current, equivalent, U2 Procedure/Instruction for impact

Appendix B
(Page 1 of 1)
TEMPORARY CONDITION LOG

NOTE

These steps will be N/A'd if no temporary condition existed. Additional copies of this table will be made as necessary.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
(Page 1 of 1)

PERMANENT PLANT INSTRUMENTATION LOG

INSTRUMENT OR INSTRUMENT LOOP #	SECTION REQUIRED	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE [2]	POST-TEST [2] CALIBRATION ACCEPTABLE INITIAL/DATE
			INIT/DATE	INIT/DATE	YES	NO		
2-LPF-15-44	6.3					☒	NR	NR
2-LPF-15-43	6.4					☒	NR	NR
2-TI-15-41	6.5					☒	NR	NR
2-FIT-15-42	6.5					☒	NR	NR
2-LPT-15-43	6.5				☒			
2-FI-15-43	6.5					☒	NR	NR
2-LPT-2-329A	6.5				☒			
2-PDI-2-330	6.5					☒	NR	NR
2-LPF-1-152	6.5				☒			
2-LPF-1-156	6.5				☒			
2-LPF-1-160	6.5				☒			
2-LPF-1-164	6.5				☒			

[1] These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (N/A)

[2] May be identified as NOT Required (NR) if instrument was not used to verify/record quantitative acceptance criteria data.

Appendix D
(Page 1 of 6)

ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-HS-1-7/181	2-M-4	SG 1 BLOWDOWN VLVS	CLOSE, then, A-P AUTO	
2-HS-1-14/182	2-M-4	SG 2 BLOWDOWN VLVS	CLOSE, then, A-P AUTO	
2-HS-1-25/183	2-M-4	SG 3 BLOWDOWN VLVS	CLOSE, then, A-P AUTO	
2-HS-1-32/184	2-M-4	SG 4 BLOWDOWN VLVS	CLOSE, then, A-P AUTO	
2-HIC-15-43	2-M-4	STM GEN BLOWDOWN FLOW CONTROL	ZERO	
2-FU-278-M4/13-B	2-M-4	STEAM GEN BLDN CONTROL VLV LOOP 1	INSTALLED[1]	
2-FU-278-M4/14-A	2-M-4	STEAM GEN BLDN CONTROL VLV LOOP 2	INSTALLED[1]	
2-FU-278-M4/15-B	2-M-4	STEAM GEN BLDN CONTROL VLV LOOP 3	INSTALLED[1]	
2-FU-278-M4/16-A	2-M-4	STEAM GEN BLDN CONTROL VLV LOOP 4	INSTALLED[1]	
2-FU-278-M4/17-A	2-M-4	STEAM GEN BLDN ISOL VLV LOOP 1	INSTALLED[1]	
2-FU-278-M4/18-B	2-M-4	STEAM GEN BLDN ISOL VLV LOOP 2	INSTALLED[1]	

Appendix D
(Page 2 of 6)

ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-FU-278-M4/19-A	2-M-4	STEAM GEN BLDN ISOL VLV LOOP 3	INSTALLED[1]	
2-FU-278-M4/20-B	2-M-4	STEAM GEN BLDN ISOL VLV LOOP 4	INSTALLED[1]	
2-BKR-275-R71D	2-M-7, INSTRUMENT POWER B RACK BKR16	UNIT CNTL BD 2-M-7B BKR16 TO 2-PNL-275-R071	ON	
2-HS-90-120A	0-M-12	STM GEN BLDN RAD MON SIG BLOCK	OFF	
2-XS-1-14	2-L-11A	SG 2 BLOWDOWN CIV	NORMAL	
2-XS-1-32	2-L-11A	SG 4 BLOWDOWN CIV	NORMAL	
2-XS-1-181	2-L-11A	SG 1 BLOWDOWN CIV IN CNTMT	NORMAL	
2-XS-1-183	2-L-11A	SG 3 BLOWDOWN CIV IN CNTMT	NORMAL	
2-FU-278-L11A1-A	2-L-11A	STEAM GEN BLDN CONTROL VLV LOOP 2	INSTALLED[1]	
2-FU-278-L11A3-A	2-L-11A	STEAM GEN BLDN CONTROL VLV LOOP 4	INSTALLED[1]	
2-FU-278-L11A5-A	2-L-11A	STEAM GEN BLDN ISOL VLVLOOP 1	INSTALLED[1]	
2-FU-278-L11A7-A	2-L-11A	STEAM GEN BLDN ISOL VLVLOOP 3	INSTALLED[1]	
2-FU-278-L11A9-A	2-L-11A	STEAM GEN BLDN CONTROL VLV LOOP 2	INSTALLED[1]	

Appendix D
(Page 3 of 6)

ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-FU-278-L11A10-A	2-L-11A	STEAM GEN BLDN CONTROL VLV LOOP 4	INSTALLED[1]	
2-FU-278-L11A11-A	2-L-11A	STEAM GEN BLDN ISOL VLVLOOP 1	INSTALLED[1]	
2-FU-278-L11A12-A	2-L-11A	STEAM GEN BLDN ISOL VLVLOOP 3	INSTALLED[1]	
2-XS-1-7	2-L-11B	SG 1 BLOWDOWN CIV	NORMAL	
2-XS-1-25	2-L-11B	SG 3 BLOWDOWN CIV	NORMAL	
2-XS-1-182	2-L-11B	SG 2 BLOWDOWN CIV IN CNTMT	NORMAL	
2-XS-1-184	2-L-11B	SG 4 BLOWDOWN CIV IN CNTMT	NORMAL	
2-FU-278-L11B1-B	2-L-11B	STEAM GEN BLDN CONTROL VLV LOOP 1	INSTALLED[1]	
2-FU-278-L11B2-B	2-L-11B	STEAM GEN BLDN CONTROL VLV LOOP 1	INSTALLED[1]	
2-FU-278-L11B3-B	2-L-11B	STEAM GEN BLDN CONTROL VLV LOOP 3	INSTALLED[1]	
2-FU-278-L11B4-B	2-L-11B	STEAM GEN BLDN CONTROL VLV LOOP 3	INSTALLED[1]	
2-FU-278-L11B5-B	2-L-11B	STEAM GEN BLDN ISOL VLV LOOP 2	INSTALLED[1]	
2-FU-278-L11B6-B	2-L-11B	STEAM GEN BLDN ISOL VLV LOOP 2	INSTALLED[1]	
2-FU-278-L11B7-B	2-L-11B	STEAM GEN BLDN ISOL VLV LOOP 4	INSTALLED[1]	

Appendix D
(Page 4 of 6)

ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-FU-278-L11B8-B	2-L-11B	STEAM GEN BLDN ISOL VLVLOOP 4	INSTALLED[1]	
2-BKR-235-2/17-E	120V AC VITAL INST POWER BD 2-II, BKR 17	AUX RELAY RACK 2-R-71/2-R-72 BUS C	ON	
2-BKR-235-3/30-F	120V AC VITAL INSTR POWER BOARD 2-III BKR 30	SEPARATION AUX RELAY PANELS 2-R-73/2-R-74	ON	
2-BKR-235-3/40-F	120V AC VITAL INSTR POWER BOARD 2-III BKR 40	SEPARATION AUX RELAY PANELS 2-R-73/2-R-74	ON	
2-BKR-235-2/10-E	120V AC VITAL INSTR POWER BOARD 2-II BKR 10	AUX RELAY RACK 2-R-75 BUS C	ON	
2-BKR-235-4/39-G	120V AC VITAL INSTR POWER BOARD 2-IV BKR 39	SEPARATION AUX RELAY PANELS 2-R-77/2-R-78	ON	
2-BKR-235-4/35-G	120V AC VITAL INSTR POWER BOARD 2-IV BKR 32	SEPARATION AUX RELAY PANELS 2-R-77/2-R-78	ON	
0-BKR-236-3/315-A	125V DC VITAL BATTERY BD III	TRAIN A STEAM GENERATORBLOWDOWN ISOL VALVES	ON	

Appendix D
(Page 5 of 6)

ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
0-BKR-236-4/315-B	125V DC VITAL BATTERY BD IV	TRAIN B STEAM GENERATORBLOWDOWN ISOL VALVES	ON	
2-BKR-291-592	2-BD-237-A A11R/757	INST PWR DIST PNL A BKR26 TO 2-JB-291-0592	ON	
2-BKR-90-120	2-BD-242-1 RAD MON & SMPLING PWR/BKR 9 A15R/757	MISC 120V AC DPL BKR 9 TO 2-RE-090-0120	OFF	
2-FU-275-R71/N23 2-FU-275-R71/N24	2-R-71 Row N, Fuses 23, & 24	STM GEN BLDN LINE HI RAD AUX REL	INSTALLED[1]	
2-FU-275-R73/K19 2-FU-275-R73/K20	2-R-73 Row K, Fuses 19 & 20	AUX FEEDWATER PMP START BYPASS INTERRUPT RELAY (RA3)	INSTALLED[1]	
2-FU-275-R73/K21 2-FU-275-R73/K22	2-R-73 Row K, Fuses 21 & 22	ST GEN BLOWDOWN CONTROL VALVE AUX RELAY	INSTALLED[1]	
2-FU-275-R73/M1 2-FU-275-R73/M2	2-R-73 Row M, Fuses 1 & 2	ST GEN BD CONT, ISO, & SAMP VLV SEP, RELAY	INSTALLED[1]	
2-FU-275-R73/N13 2-FU-275-R73/N14	2-R-73 Row N, Fuses 13 & 14	FCV-1-7,25,181,183 SEP AND AUX RELAYS TRAIN A	INSTALLED[1]	

Appendix D
(Page 6 of 6)
ELECTRICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-FU-275-R75/M13 2-FU-275-R75/M14	2-R-75 Row M, Fuses 13 &14	STM GEN BLDN ISOL & CONT VLV SEP RELAY	INSTALLED[1]	
2-FU-275-R78/K19 2-FU-275-R78/K20	2-R-78 Row K, Fuses 19 & 20	AUX FEEDWATER PMP START BYPASS INTERRUPT RELAY (RB3)	INSTALLED[1]	
2-FU-275-R78/K21 2-FU-275-R78/K22	2-R-78 Row K, Fuses 21 & 22	ST GEN BLDN CONT & ISO VLV SEP RELAY	INSTALLED[1]	
2-FU-275-R78/K23 2-FU-275-R78/K24	2-R-78 Row K, Fuses 23 & 24	ST GEN BLDN CONT & ISO VLV AUX RELAY	INSTALLED[1]	
2-FU-275-R78/N13 2-FU-275-R78/N14	2-R-78 Row N, Fuses 13 & 14	FCV-1-14,32,182,184 SEPAND AUX RELAYS TRAIN B	INSTALLED[1]	
2-HS-15-44	2-JB-291-1775, T11J/708	SG BLOWDOWN DISCH TO CTBD	CLOSE	
2-FC-15-44	2-L-657, T14J/708	SG BLOWDOWN FLOW CONTROL	ZERO	

[1] When installing fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation or visual indication.

Appendix E
(Page 1 of 1)

MECHANICAL LINEUP

IDENTIFICATION	LOCATION	NOMENCLATURE	POSITION	INITIAL/DATE
2-ISV-15-43A	On 2-FCV-15-43 T14J/708	ISOLATION VALVE FOR 2-FCV-15-43	CLOSED	
2-ISV-15-43B	On 2-FCV-15-43 T14J/708	ISOLATION VALVE FOR 2-FCV-15-43	CLOSED	
2-DRV-15-43	On 2-FCV-15-43 T14J/708	DRAIN VALVE FOR 2-ACUM-15-43	CLOSED	
2-ISV-32-2036	T14J/715	CONTROL AIR ISOLATION VALVE TO 2-FCV-15-43	OPEN	
0-ISV-32-779	T15F/708	CONTROL AIR BRANCH ISOL TO 2-FCV-15-43	OPEN	
2-ISIV-15-44	T14J/708	CONTOL AIR ISOLATION TO 2-FC-15-44	OPEN	
2-ISV-32-2047	T15J/708	CONTROL AIR ISOLATION VALVE TO 2-FCV-15-44	OPEN	
2-ISV-32-768	T15K/708	CONTROL AIR HDR ISOL VALVE TO 2-FCV-15-44	OPEN	

Appendix F
(Page 1 of 3)

BACKGROUND CALCULATIONS

Measurement uncertainties for parameters measured in this test must be incorporated into the test acceptance criteria.

1.0 HTX TEMPERATUR MEASUREMENTS

A. 1st Stage HTX SGBD Outlet Temperature is measured using 2-TIS-15-42. The uncertainty associated with this measurement is a function of both 2-TIS-15-42 and 2-TE-15-42. MEL package 11EIC4855 R1 of EDCR 57376A, provides and accuracy of $\pm$ 4°F and $\pm$ 2°F for 2-TIS-15-42 and 2-TE-15-42, respectively. Uncertainty associated with this temperature measurement is the sum of the individual uncertainties:

Total Temperature Uncertainty ($TT_{UC\ TIS}$)=$\pm$(4+2)=$\pm$6°F

Required 1st Stage HTX SGBD Outlet Temperature ($T_{R\ TIS}$) is $\leq$ 172°F. To conservatively adjust for measurement uncertainty, the Acceptance Criteria for this measurement will be: $T_{AC\ TIS}=T_{R\ TIS}-T_{UC\ TIS}$

$T_{AC\ TIS}$=172°F-6°F = 166°F

B. 1st Stage HTX Condenesate Outlet Temperature is measured using 2-TIC-2-329A. The uncertainty associated with this measurement is a function of both 2-TIC-2-329A and 2-TE-2-329A. MEL package 11EIC4855 R1 of EDCR 57376A, provides and accuracy of $\pm$ 4°F and $\pm$ 2°F for 2-TIC-2-329A and 2-TE-2-329A, respectively. Uncertainty associated with this temperature measurement is the sum of the individual uncertainties:

Total Temperature Uncertainty ($TT_{UC\ TIC}$)=$\pm$(4+2)=$\pm$6°F

Required 1st Stage HTX Condenesate Outlet Temperature ($T_{R\ TIC}$) is $\leq$ 230°F. To conservatively adjust for measurement uncertainty, the Acceptance Criteria for this measurement will be: $T_{AC\ TIC}=T_{R\ TIC}-T_{UC\ TIC}$

$T_{AC\ TIC}$=230°F-6°F = 224°F

Appendix F
(Page 2 of 3)

BACKGROUND CALCULATIONS

1.0 HTX TEMPERATUR MEASUREMENTS (continued)

C. 2nd Stage HTX SGBD Outlet Temperature is measured using M&TE installed in at 2-TE-15-43. Specifically, a Thermocouple Test Set/Calibrator is installed across the Thermocouple leads of 2-TE-15-43. The uncertainty associated with this measurement is a function of both 2-TE-15-43 and the Thermocouple Test Set/Calibrator. 2-TE-15-43 is a type "T" thermocouple and can be assumed to have an accuracy of $\pm$1% or better. With a temperature measurement of approximately 150°F this translates to $\pm$1.5°F. The M&TE used for this measurement will have an accuracy of $\pm$2°F per checkout instruction in 4.2[1]B. Uncertainty associated with this temperature measurement is the sum of the individual uncertainties:

Total Temperature Uncertainty ($TT_{UC\ TE}$)=$\pm$(1.5+2)=$\pm$3.5°F - rounded to $\pm$4°F

Required 1st Stage HTX Condenesate Outlet Temperature ($T_{R\ TE}$) is $\leq$ 144°F. To conservatively adjust for measurement uncertainty, the Acceptance Criteria for this measurement will be: $T_{AC\ TE}=T_{R\ TE}-T_{UC\ TE}$

$T_{AC\ TE}$=144°F-4°F = 140°F

2.0 SGBD FLOWRATE MEASUREMENT

SGBD total flow rate is determined using permanent plant instrumentation associated with the following plant loops: 2-LPF-1-152, 2-LPF-1-156, 2-LPF-1-160 & 2-LPF-1-164. The full span loop uncertainties associated with these loops at maximum instrument range is $\pm$2.310gpm. Total flow is obtained by summing the four instrument values. Therefore the total uncertainty associated for the total flow measurement can be calculated by:

Total Flow Uncertainty (TF_{UC})=$\pm$(2.310gpm×4)=$\pm$9.240gpm - rounded to $\pm$10gpm.

Required total flow (TF_R) is 350gpm when SGBD is routed to Condensate Demineralizers. To conservatively adjust for measurement uncertainty, the Acceptance Criteria for this measurement will be: $TF_{AC}=TF_R+TF_{UC}$

TF_{AC}=350+10=360gpm

Appendix F
(Page 3 of 3)

BACKGROUND CALCULATIONS

3.0 STOPWATCH USE

Handheld digital stopwatches are used in several places in this instruction. Digital stopwatches have an accuracy of $\pm$0.1sec. This instrument error is negligible compared to the inherent human error involved in using a handheld stopwatch. Stopwatch timing uncertainties will not be calculated in this instruction under the assumption that any instrument uncertainty will be insignificant compared to the human uncertainty.

Data Sheet 1
(Page 1 of 1)

System Performance Test at 250°F (Subsection 6.5.2) SGBD to CTBD

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	
U1 SGBD discharge to Cooling Tower Flow Rate	☐ 1-FIT-15-42 [T8J/708] or (check one) ☐ ICS Point F0619A	gpm	

Data Sheet 2
(Page 1 of 1)

System Performance at Test 350°F (Subsection 6.6.2) SGBD to CTBD

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	
U1 SGBD discharge to Cooling Tower Flow Rate	☐ 1-FIT-15-42 [T8J/708] or (check one) ☐ ICS Point F0619A	gpm	

Data Sheet 3
(Page 1 of 1)

System Performance Test at 450°F (Subsection 6.7.2) SGBD to Condensate Demineralizer

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	

Data Sheet 4
(Page 1 of 1)

System Performance Test at 450°F (Subsection 6.7.3) SGBD to CTBD

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	
U1 SGBD discharge to Cooling Tower Flow Rate	☐ 1-FIT-15-42 [T8J/708] or (check one) ☐ ICS Point F0619A	gpm	

Data Sheet 5
(Page 1 of 1)

System Performance Test at 557°F (Subsection 6.8.2) SGBD to Condensate Demineralizer

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	

Data Sheet 6
(Page 1 of 1)

System Performance Test at 557°F (Subsection 6.8.3) SGBD to CTBD

Description	Device	Data	Initial/Date
S/G 1 Flow Rate	ICS Point F0408A	gpm	
S/G 2 Flow Rate	ICS Point F0428A	gpm	
S/G 3 Flow Rate	ICS Point F0448A	gpm	
S/G 4 Flow Rate	ICS Point F0468A	gpm	
SGBD Total Flow	ICS Point U0564	gpm	
Second Stage HTX SGBD Flow Rate	2-FI-15-43 [T15J/ 708]	gpm	
SGBD discharge to Cooling Tower Flow Rate	☐ 2-FIT-15-42 [T15J/708] or (check one) ☐ ICS Point F0619A	gpm	
2-FCV-15-43 % Open	2-FCV-15-43 [T14J/708]	%	
2-HIC-15-43 Setpoint	2-HIC-15-43 [2-M-4]	%	
2-FCV-15-44 % Open	2-FCV-15-44 [T15J/708]	%	
2-FC-15-44 Setpoint	2-FC-15-44 [T14J/708]	%	
First Stage HTX SGBD Inlet Temp	2-TI-15-41 [T10G/708]	°F	
First Stage HTX SGBD Outlet Temp	2-TIS-15-42 [T9F/708]	°F	
First Stage HTX Condensate Inlet Temp	2-TW-2-329B [T10G/708] M&TE ID #:	°F	
First Stage HTX Condensate Outlet Temp	2-TIC-2-329A [T9F/708]	°F	
Second Stage HTX SGBD Outlet Temp	2-TE-15-43 [T14H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Inlet Temp	2-TW-2-330A [T15H/708] M&TE ID #:	°F	
Second Stage HTX Condensate Outlet Temp	2-TW-2-330B [T15H/708] M&TE ID #:	°F	
First Stage HTX SGBD Inlet Pressure	2-DRV-15-914 [T10J/708] M&TE ID#:	psig	
First Stage HTX SGBD Outlet Pressure	2-DRV-15-884 [T10G/708] M&TE ID #:	psig	
Second Stage HTX SGBD Outlet Pressure	2-DRV-15-889 [T15H/708] M&TE ID #:	psig	
Second Stage HTX SGBD Condensate DeltaP	2-PDI-2-330 [T14/708]	psig	
U1 SGBD discharge to Cooling Tower Flow Rate	☐ 1-FIT-15-42 [T8J/708] or (check one) ☐ ICS Point F0619A	gpm	