

Objectives: To evaluate the applicants' ability to reduce power using NOPs while maintaining Tave matched to Tref, and to use AOPs to respond to a pressurizer level channel instrument failure, complicated by the loss of letdown with a turbine runback. The candidates will then be evaluated using the FOPs to respond to a small S/U tube leak that increases in size until a reactor trip is required. At this point the leak increases to a 330 GPM rupture. Mitigation will be complicated by the ruptured generator 5/0 PORV failing to reseal after opening and the loss of the A ND and NV pumps.

Initial Conditions: 100% Power 200 EFPD 807 [B] 100% CPL Equilibrium Xe (SNAP 153)
 Prevent A NV pump from starting (auto and manual)
 DO IA inoperable
 ND pump IA inoperable
 1NV123B binding closed

Turnover: 100% Power 200 EFPD 807 [B] 100% CPL Equilibrium Xe
 IA ND pump tagged out for an oil change. Back in 3 hours.
 IA DIG in maintenance mode for gasket change. Back early next shift.

Reduce load to 65% due to Chemistry concerns for a CFPT condenser tube leak.

EventM	Event	Description
1	N/A N-BOP	Boration for load decrease
2	N/A R-RO	Decrease turbine load
3	XMT-NC013 I~BOP	Pressurizer Level Channel II fails LOW with loss of normal letdown
4	N/A C-BOP	Failure to restore any letdown to service
5	MAL-1Rx004 C-RO	Turbine fails to runback in auto on loss of Generator Breaker OVR-EPOOSB OVR-EPOO6C
6	MAL-SCOOI B	C-BOP I B Steam Generator Tube Leak. IA NV Pump fails to start. SV=190 MAL-NVOO6A
7	MAL-SCOOIS M	IB Steam Generator Rupture coincident with manual reactor trip SV=330
8	MAL-SMOO2B	C-RO S/G PORV on B SIG leaks by seat just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure) Sv=100

NUREO-1021 Page 1 Rev. 8
 Appendix D Scenario Outline NRC Set 3 Form ES-D-I
 Simulation Facility: Catawba Scenario No.: NRC-3 Op-Test No: _____

Examiners: _____ Operators: _____

Objectives: To evaluate the applicants' ability to reduce power using NOPs while maintaining Tave matched to Tref; and to use AOPs to respond to instrument failures in the Rod Control program, a failure of the transmitter controlling reactor coolant pump seal injection flow and the ability to diagnose and use the AP for a small Reactor Coolant System leak. The applicants will be evaluated using EOPs to mitigate an ejected control rod that results in a small break LOCA. Mitigation efforts will be complicated by the failure of the reactor to automatically trip and the failure of SI cold leg injection valves INI-9A and INI-IOB to open automatically. When the emergency diesel generators are secured in F-i, normal power will be lost to 1 ETA. The applicants will have to restart the equipment that was running prior to the loss of 1 ETA.

Initial Conditions: 100% power 400 EFPD 30 [B] Equilibrium Xenon conditions (SNAP 151)
 Block auto and manual reactor trip
 Block auto safety injection

Turnover: 100% power 400 EFPD 30 [B] Equilibrium Xenon conditions
 IB diesel in maintenance mode for injector maintenance
 18 CA pump tagged out for an oil change. Back in 4 hours.
 Channel 4 FWST level transmitter is inoperable (Failed)
 Thunderstorms in the area
 Reduce power to 0% in preparation for the next refueling outage

Event No.	Event	Description
1	N-BOP	Boration for load decrease
2	R-RO	Decrease turbine load
3	XMT+iCo61 1-RO	NC Loop B Tcold fails to 6300 F
4	XMT44VO52 1-BOP	NCP seal injection transmitter failure

5 M Small reactor coolant leak (~90 gpm)
 6 MAL~Coos M Rod ejection
 BIO
 6aMALIPXOOIA C-RO ATWS
 MAL~PXOO1B
 MALI PXoU~
 MAL4PXOO2S
 6b VLV*ZIOOIA C-fIOP Failure of INI-9A and INI-IOB to open automatically
 vLv411002A
 7 OVR~Po290C-HOP Loss of normal power to I ETA
 NUREG-1021 Page 1 Revision 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 1

Event Description: Boration for load decrease

Time Position Applicant's Actions or Behavior

BOP Refer to OPIIIA/61501009, Boron Concentration Control

BOP Ensure the following valve control switches in "AUTO":

- INV-238A (B/A Xfer Pmp To Blender Ctrl)
- 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)

BOP Adjust the boric acid batch counter to the desired volume of boric acid to be added.

BOP Place the "NC MAKEUP MODE SELECT" switch in "BORATE".

BOP Adjust the controller for 1 NV-238A (B/A Xfer Pmp to Blender Ctrl)

BOP Ensure 1 NV-236A (B/A Xfer Pmp to Blender Ctrl) controller in

BOP Ensure at least one boric acid transfer pump in "AUTO" or "ON".

BOP Place the "NC MAKEUP MODE SELECT" switch in "START" position.

BOP Verify the following valves open:

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv)
- 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)

BOP If in "AUTO", verify the boric acid transfer pump starts.

NUREG-1021 1 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 1

Event Description: Boration for load decrease

Time Position Applicant's Actions or Behavior

BOP Verify proper flow by observing the boric acid flow totalizer.
 {PIP 96-0137}

BOP When the desired volume of boric acid is reached on the boric acid batch counter, ensure the following valves close:

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv)
- 1 NV-i 86A (B/A Blender Ott To VCT OtIt)

BOP IF desired, flush the makeup line as follows:

- Open the following valves:
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)
- Ensure one reactor makeup water pump is in "ON".
- WHEN -20 gallons of makeup water have been flushed through the makeup line, close the following valves:
 - i NV-242A (RMWST To B/A Blender Ctrl)
 - 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)
- Place the following valve control switches in "AUTO":
 - i NV-242A (RMWST To B/A Blender Ctrl)
 - I NV-i 86A (B/A Blender OtIt To VCT OtIt)
- IF liQI required for current plant operation, place the reactor makeup water pump started in earlier step in "AUTO".

IF automatic makeup is desired, refer to Enclosure 4.1 (Automatic Makeup).

NUREG-1021 2 of 38 Rev. 5
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 2

Event Description: Decrease turbine load

[Time Position] Applicant's Actions or Behavior

RO Refer to OPI1/B/6300/OO1, Turbine Generator, Enclosure 4.2, Section 2.4.

RO Depress the "Load Rate" pushbutton and verify it illuminates.

RO Input the desired load rate on the numeric keypad and verify the load rate appears on the Variable Display.

RO Depress the "Enter" pushbutton.

RO Depress the "Target" pushbutton and verify it illuminates.

RO Input the desired load target on the numeric keypad and verify the load target appears on the Target Display.

RO Depress the "Enter" pushbutton.

RO To start load decrease, depress the "Go" pushbutton and verify it

NUREG-1021 3 of 38 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 3

Event Description: Pressurizer Level Channel II fails LOW

Time Position Applicant's Actions or Behavior

BOP Recognizes Pressurizer Level Channel II has failed LOW and informs SRO.

- 1AD-6, D19 (PZR LO LEVEL HTR OFF & LETDOWN SECURED annunciator
- 1AD-6, A110 (PZR HTR CONTROLLER TROUBLE) annunciator
- Pressurizer level channel II 1NCP5153offscale~LOW

EXAMINER NOTE: Annunciator response is anached.

BOP Responds to event using the annunciator response.

BOP Recognizes that letdown has been lost due to this failure and informs SRO.

NUREG-1021 4 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 4

Event Description: Loss of letdown - establish excess letdown

Time Position Applicant's Actions or Behavior

SRO Implements APIIINSSOOI2 (Loss of Charging or Letdown) Case II (Loss of Letdown) and directs operators.

BOP Verify all Pzr level channels - INDICATING THE SAME.

Determines that channel II has failed low and informs SRO.

SRO Transitions to Step 1 RNO and directs the operators.

BOP IF the controlling channel is failed low, THEN place "PZR LEVEL CTRL SELECT" switch in any alternate operable position.

SRO Transitions back to Step 2 NER column and directs operators.

RO Stop any power changes.

BOP Verify the following letdown isolation valves - CLOSED.

- INV-10A (Letdn Orif IB OtIt Cont Isol)
- INV-11A (Letdn Orif ic OtIt Cont Isol)
- INV-13A (Letdn Orif IA Ott Cont Iso)

BOP Verify PZR level - GREATER THAN 17%

BOP Control charging to stabilize Pzr level at program level while maintaining seal injection flow.

NUREG-1021 5 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 4

Event Description: Loss of letdown - establish excess letdown

Time Position Applicant's Actions or Behavior

BOP Ensure "PZR HEATER GROUP iC" - ON.

BOP Control VCT level as follows:

a. Verify VCT makeup - SET FOR DESIRED BORON CONCENTRATION

b. Verify VCT makeup - IN AUTOMATIC

SRO Determine and oorrect cause of loss of letdown.

BOP Ensure "PZR LEVEL TO REC SEL" is selected to an operable

channel.

SRO Ensure compliance with appropriate Tech Specs:

- 3.3.1 (Reactor Trip system (RTS) Instrumentation)
- 3.3.3 (Post Accident Monitoring (PAM) Instrumentation)
- 3.3.4 (Remote Shutdown System)
- 3.4.1 (RCS Pressure, Temperature, and Flow Departure From Nucleate Boiling (DNB) Limits)

NUREG~IO21 6 of 38 Rev. S

Op-Test No.: NRC Scenario No.: 1 Event No.: 4

Event Description: Loss of letdown - establish excess letdown

Time Position Applicant's Actions or Behavior

BOPEvaluate normal letdown restoration as follows:

a. Verify at least one of the following valves - CLOSED:

- 1NV-1A (NC Letdn To Regen Hx Isol)

OR

- 1 NV-2A (NC Letdn To Regen Hx Isol)

b. Perform the following.'

1) Establish excess letdown. REFER TO OP/1/k62001001
(Chemical and Volume Control System)

2) Dispatch operator(s) to pressurize the normal letdown line.
REFER TO Enclosure 1 (Pressurization Of Normal Letdown
Line).

C. Do not continue in this procedure until one of the following is met:

- Notified by dispatched operator that the letdown line is
pressurized.

OR

- Station management authorizes normal letdown restoration.

SRO Determine that normal letdown is currently not available due to
1 NV-2A closing and directs excess letdown to be placed in service.

SRO REFERS TO OP/1/N6200/OO1 (Chemical and Volume Control
System) Enclosure 4.12 (Establishing/Securing Excess Letdown) and
directs operators.

Time Position Notify Primary Chemistry of the following: (PIP 96-3230}

- Excess Letdown will be placed in service
- VCT pressure will be reduced to - 20 psig

NUREG-1021

7 of 38

Rev. S

Appendix D

Operator Actions

Form ES-ID-2

Op-Test No.: NRC Scenario No.: I Event No.: 4

Event Description: Loss of letdown - establish excess letdown

Time Position Applicant's Actions or Behavior

BOP CAUTION: At least 15 psig backpressure shall be maintained on the
NCP #1 seals

Reduce VCT pressure to - 20 psig per Enclosure 4.20 (Adjusting the
Volume Control Tank (VCT) Hydrogen Pressure)

BOP Open the following valves to establish KC flow to the Excess
Letdown Heat Exchanger:

1 KC-305B (Exs Letdn Hx Supply Cont Isol)

I KC-3 1 5B (Excess Letch Hx Ret Cont Isol)

BOP Verify 1NV-125B (Excess Letdn Hx Otit Ctrl) is in the "VCT" position.

BOP IF either of the following conditions exist, place 1 NV-i 25B (Excess

Letdn Hx OtIt Ctrl) in the "NCDT" position:

- VCT pressure greater than or equal to 45 psig as indicated on 1 NVP5SOO (VCT Vent Press)
- VCT level greater than or equal to 50% as indicated on 1 NVP5761 (VCT Level)

BOP Open the following valves:

- 1NV-122B (Loop C To Exs Letdn Hx Isol)
- 1NV-123B (Loop C To Exs Letdn Hx Isol)

Determines that 1NV-123B will not open and informs SRO.
SRO determines that no letdown is available and stops in API12.
EXAMINER NOTE: Letdown will not be restored.

NUREG-1021 S of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

- ALL Recognize indication of a generator breaker trip:
- iAD-1 1, C/il (Gen Bkr A Overcurrent) annunciator
- Determines that a runback should be occurring but turbine is not automatically running back.
Recognize conditions for AP/1/N5500103 (Load Rejection), inform SRO, and perform immediate actions from memory.
- SRO Implements AP/11AI5500/03 (Load Rejection) and directs operators.
- RO Verify turbine load - DECREASING.
- Determines turbine load is not decreasing and informs SRO.
- SRO Transitions to Step I RNO and directs operators.
- RO Perform the following:
- a. Select "MANUAL" on the turbine control panel.
 - b. Depress "CONTROL VALVES LOWER" pushbutton and reduce turbine load as required.
- SRO Transitions to Step 2 AIER column and directs operators.
- RO Verify proper reactor response:

- Control rods - IN "AUTO" AND STEPPING IN
- FIR neutron flux - DECREASING

NUREG-1021 IO of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5-6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

RO Verify proper steam dump operation as follows:

- a. "C-9 COND AVAILABLE FOR STM DUMP" status light (1SI-18) - LIT
 - b. "C-7A LOSS OF LOAD INTLK COND DUMP" status light (iSI-18)-LIT
- C. Steam dump valves - MODULATING

d. T-Avg - DECREASING TO T-REF

BOP Verify Pzr PORV and Pzr spray valve status as follows:

a. All Pzr PORVs - CLOSED

b. Normal Pzr spray valves - CLOSED

SOP Verify proper CM System operation as follows:

a. WHEN reactor power is less than 75%, THEN secure both C-Htr drain pumps. REFER TO OP/1/B16250/004 (Feedwater Heater, Vents, Drains And Bleed Systems)

b. Verify reactor power - GREATER THAN 56% PRIOR TO THE EVENT

c. Verify standby hotwell pump(s) - ON

d. Verify standby condensate booster pump(s) - ON

Determines that standby hotwell and booster pumps did not start and manually starts them if necessary per Step S.c and S.d RNO.

BOP Verify the following generator alarms - DARK:

• 1AD-11,CI1 "GEN BKRAOVER CURRENT"

• IAD-il, F/i "GEN BKR B OVER CURRENTS

NUREG~1021

11 of 38

Rev, S

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

[Time]IIWfition Applicant's Actions or Behavior

EXAMINER NOTE: If alarm in at this point, SRO will go to RNO.

SRO EXAMINER NOTE: This is Step 6 RNO.

Ensure turbine generator load - REDUCED TO APPROXIMATELY 50% AND THE ALARM CLEARS

RO Verify SIG levels are adequate as follows:

• All SIG low level alert alarms (IADA) - DARK

• All S/C low CF flow alarms (1 ADA) - DARK

EXAMINER NOTE: If alarm in at this point, SRO will go to RNO.

SRO EXAMINER NOTE: This is Step 7 RNO.

Perform the following:

a. Ensure feedwater regulating valves - MODULATING TO CONTROL SIG LEVELS AT PROGRAM SETPOINT.

b. IF any S/C(s) NR level is decreasing in and uncontrolled manner, THEN:

Determines this step is N/A and continues.

SRO Transitions to Step 8 NER column and directs operators.

BOP Verify AS header pressure - GREATER THAN OR EQUAL TO 140 PSIG.

BOP Monitor Enclosure 3 (Rod Insertion Limit Boration).

EXAMINER NOTE: AP111AI5500103, Enclosure 3 is aflached.

NUREG-1021

12 of 3S

Rev. S

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: I Event No.: 5 - 6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

RO Verify reactor power - LESS THAN 30%

Determines that power is greater than 30% and informs SRO

SRO Transitions to Step 10 RNO and directs operators.

SRO a. IF the runback target load is less than 30%, THEN:

Determines this step is N/A and continues

b. WHEN the appropriate runback target load is reached, THEN:

- 1) Stabilize unit at current power level
 - 2) Maintain control rods above insertion limits
 - 3) Adjust the following as required to maintain T-Avg within 10F of T-Ref:
 - Turbine load
 - Control rods
 - Boron Concentration
- c. GOIQStep12.

SRO Transitions to Step 12 A/ER and directs operators.

NUREG-1021 13 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

RO/BOP Verify the following PCBs - CLOSED:

- Generator breaker IA
- Generator breaker 1 B
- PCB 14
- PCB15
- PCB17
- PCB18

Determines that Generator breaker 1 B is not closed and informs SRO.

SRO Transitions to Step 12 RNO and directs operators.

SRO Perform the following:

a. IF the turbine generator is separated from the grid, THEN
Determines step is N/A and continues.

b. IF load rejection caused by loss of main busline IA or IB,
THEN:

Determines step is N/A and continues.

c. IF a full load rejection has occurred, IHitL:
Determines step is N/A and continues.

SRO Transitions to Step 13 NER column and directs operators.

RO Adjust power factor as necessary. REFER TO Unit 1 Revised Data
Book Figure 43.

NUREG-1021 14 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

Time_mtion Applicant's Actions or Behavior

ALLWHEN the appropriate runback target load is reached, THEN:

- Stabilize unit at appropriate power level
- Maintain control rods above insertion limits
- Adjust the following as required to maintain T-Avg within 10F of T-Ref
 - Turbine load
 - Control rods
 - Boron concentration

ROISRO Notify System Operating Center (SOC) using the red dispatcher telephone of current unit status.

- CF pump. REFER TO OP/1/AI62501001 (Condensate and Feedwater)
- RC pump(s) and cooling tower fans. REFER TO OP/i IB/6400/OO1 A (Condenser Circulating Water)
- Hotwell pump(s)
- Condensate booster pump(s).

NUREG-1021 15 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

RO Reset steam dump valves as follows:

- a. Verify reactor power - STABLE.
- b. Verify steam dump valves- IN "T AVG" MODE.
- c. Verify steam dump valves - CLOSED.
- d. Reset steam dump valves.
- e. Verify the following status lights (1SI-18) - DARK.

- "C-7A LOSS OF LOAD INTLK COND DUMP"
- "C-7B LOSS OF LOAD INTLK ATMOS DUMP"

f. IF "T AVG" mode of operation is available, THEN ensure steam dump valves in "T AVG" mode.

g. Verify "STM DUMP CTRL" - IN AUTOMATIC.

RO Verify reactor power - GREATER THAN 15%.

ROIBOP Verify CA Pumps - OFF.

RO Verify reactor power change - GREATER THAN OR EQUAL TO 15% IN AI HOUR PERIOD.

SRO/BOP/RO Verify the following sections to take appropriate samples:

- Radiation Protection to sample and analyze gaseous effluents. REFER TO Selected Licensee Commitments Manual, Section 16.11-6.
- Primary' Chemistry to sample for isotopic analysis of iodine. REFER TO Tech Specs 3.4.16 (Sample must be taken between 2 hours and 6 hours following last power change greater than or equal to 15% rated thermal power within a 1 hour period).

NUREG-1021 16 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 5 - 6

Event Description: Turbine runback

Time Position Applicant's Actions or Behavior

SRO Ensure compliance with appropriate Tech Specs:

- 3.1.1 (Shutdown Margin (SDM))
- 3.1.6 (Control Bank Insertion Limits)
- 3.8.1 (AC Sources - Operating)

SROIBOPIRO Notify Reactor Group Engineer of occurrence.

ALL Determine long term plant status. RETURN TO OP111N61001003
(Controlling Procedure for Unit Operation).

NUREG-1021 17 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 7 - 8

Event Description: 1 B Steam Generator Tube Leak, IA NV pump fails to start.

Time Position Applicant's Actions or Behavior
ALL Recognize symptoms of a Steam Generator Tube Leak:

- Charging flow increasing
- EMF 33, 72, 73, 27, 31 alarm

SRO Implements AP111N5500110 (Reactor Coolant Leak) Case I, Steam
Generator Tube Leak, and directs operators

ALL Monitor Enclosure 1 (Foldout Page)
ROIBOP Verify Pzr level - STABLE OR INCREASING

Determines Pzr level is decreasing and informs SRO.

SRO Transitions to Step 2 RNO and directs operators.

NUREG-1021 18 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 7 - 8

Event Description: 1 B Steam Generator Tube Leak, IA NV pump fails to start.

Time Position Applicant's Actions or Behavior
BOP Perform the following:

- Maintain charging flow less than 180 GPM
- Manually throttle 1 NV-294 (NV Pmps A&B Disch Flow Ctrl) to stabilize Pzr level
- IF Pzr level is stable OR increasing, THEN GO TO Step 3.

Determines Pzr level is still decreasing and continues in RNO.

d. IF Pzr level continues to decrease, THEN:

- 1) Reduce letdown flow to 45 GPM as follows:
EXAMINER NOTE: The Crew recognizes all letdown is isolated and intent of this step is met.
- 2) IF Pzr level continues to decrease, THEN ensure the following valves closed: f IA Ott Cont Isol)
Determine step is N/A intent met and continues in RNO column.
- 3) IF Pzr level is stable OR increasing, THEN GO TO Step 3.
Determines Pzr level is continuing to decrease and continues in RNO.

NUREG-102 1 19 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, S/C PORV on B S/G leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

SRO 4) IF Pzr level continues to decrease, THEN:

- a) Start an additional NV pump as follows:
 - (1) Open 1NV-252A (NV Pumps Suct From FWST)
 - (2) Open 1NV-253B (NV Pumps Suct From FWST)
 - (3) Close 1 NV-i 88A (VCT OtIt Isol)

- (4) Close 1NV-189B (VCT OtIt Isol)
- (5) Start the desired NV Pump

Recognizes that IA NV Pump fails to start and informs SRO.

Determines that no additional charging is available and determines that Pzr level is continuing to decrease.

- b) Adjust Control Rods and turbine load as required to maintain T-Avg within 10F of T-Ref.

SRO REFER TO the following:

- AP/11AI5500109 (Rapid Downpower (OR))
- OP1IA/61001003 (Controlling Procedure for Unit Operation)

SRO c) LFPzr level is stable OR increasing THEN GO TO Step 3.

Determines that Pzr level is continuing to decrease and continues in RNO.

- d) IE Pzr level is stable OR increasing THEN GO TO Step 3.

Determines that Pzr level is continuing to decrease and continues in RNO.

NUREG-1021 20 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

ROIBOP e) if Pzr level continues to decrease OR Pzr level cannot be maintained greater than 11%, then:

- (1) Manually trip reactor
- (2) Manually initiate S/I
- 3) GO TO EPI1IA/5000/E-0 (Reactor Trip Or Safety Injection).

NUREG-1021 21 of 38 Rev. S

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Position Applicant's Actions or Behavior

SRO Enters EPI1IA/50001E-0 (Reactor Trip Or Safety Injection) and directs operators

ALL Monitor Enclosure (1) (Foldout Page)

RO Verify Reactor Trip:

- All rod bottom lights - LIT
- All reactor trip and bypass breakers - OPEN
- hR amps - DECREASING

RO Verify Turbine Trip:

- All turbine stop valves - CLOSED

OR

- All turbine control valves - CLOSED

BOP Verify 1 ETA and 1 ETB - ENERGIZED.

BOP Verify S/I is actuated:

a. "SAFETY INJECTION ACTUATED" status light (1SI-13) - LIT

b. EIS load sequencer actuated status lights (1SI-14) - LIT

RO Announce "Unit 1 Safety Injection"

SRO Implement RPIOIA/50001O1 (Classification Of Emergency).

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

- | Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | BOP | Verify Phase A Containment Isolation status as follows:
a. Phase A RESET lights - DARK
b. Monitor Light Panel Group 5 St lights - LIT
EXAMINER NOTE: IKC-305 may be in wrong position due to attempt to put excess letdown in service earlier in the scenario.
If so, SOP will close it in response to this step's RNO. |
| | ALL | Verify proper Phase B actuation as follows:

a. Containment pressure - HAS REMAINED LESS THAN 3 PSIG
b. IF AN ANY TIME containment pressure exceeds 3 PSIG while in this procedure, Itjijt' perform Step 10.a. |

- RO Verify proper CA pump status as follows:
- Motor driven CA pumps - ON
 - 3 SIG N/R levels - GREATER THAN 11%

- BOP Verify all of the following S/I pumps - ON:
- NVpumps
 - Nflpumps
 - NI pumps

Determines that IA NV pump and IAND pump are off and informs

SRO.

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

- | [Time | Position | Applicant's Actions or Behavior |
|-------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | BOP | Perform the following for affected trains:
a. Reset ECCS.
b. Reset DIG load sequencer.
c. Manually start affected pump (1/A NV Pump does not start).
d. IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on. |
| | BOP | Verify proper ventilation systems operations.
• REFER TO Enclosure 2 (Ventilation System Verification)
• Notify Unit 2 operator to perform Enclosure 3 (Opposite unit Ventilation Verification) |

EXAMINER NOTE: Enclosure 2 of this procedure is affached.

- RO Verify all S/G pressures - GREATER THAN 775 PSIG
- BOP Verify proper S/I flow as follows:
- "NV S/I FLOW" - INDICATING FLOW
 - NC Pressure - LESS THAN 1620 PSIG
- Determines NI pressure is greater than 1620 psig and informs SRO.

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat -just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time	Position	Applicant's Actions or Behavior
BOP		Perform the following: 1) Ensure ND pump miniflow valve on operating ND pump(s) - OPEN 2) 'Ethe ND Pump minWow valve(s) cannot be opened, THEN perform the following for the affected train(s): Determines that this step is N/A and continues in RNO column. 3) GOTOSTepi8.
SRO		Transition to step 18 A/ER and directs operators.
RO		Control SIG levels as follows: a. Verify total CA flow - GREATER THAN 450 GPM b. WHEN at least one SIG NIR level is greater than 11% (29% ACC), THEN throttle feed flow to maintain all SIG NIR levels between 11% (29% ACC) and 50%.
RO		Verify all CA isolation valves - OPEN

BOP Verify S/I equipment status based on monitor light panel - IN PROPER ALIGNMENT

Determines that IA NV pump, IAND pump, and possibly 1KC-305 are not in proper alignment and informs SRO.

SRO Transition to Step 20 RNO and directs operators

NUREG-1021 25 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time	Position	Applicant's Actions or Behavior
BOP		Manually align equipment.
SRO		Transitions to Step 21 AIER column and directs operators.
RO		NOTE: Enclosure 4 (NC Temperature Control) shall remain in effect until subsequent procedures provide alternative NC temperature Control NC temperature. REFER TO Enclosure 4 (NC Temperature EXAMINER NOTE: Enclosure 4 of this procedure is affached.

BOP/RO Verify Pzr PORV and Pzr spray valve status as follows:
a. All Pzr PORVS - CLOSED
b. Normal Pzr spray valves - CLOSED
c. At least one Pzr PORV isolation valve - OPEN

RO Verify NC subcooling based on core exit TICs - GREATER THAN 00F

BOP Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING
- ALL SIGS - PRESSURIZED

NUREG-1021 26 of 38 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: I Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, S/G PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time	Position	Applicant's Actions or Behavior
ROIBOP		Verify SIG tubes are intact as follows:

Verify the following EMF trip 1 lights - DARK:

- 1 EMF-33 (Condenser Air Ejector Exhaust)
- IEMF-34 (SIG Sample)
- 1EMF-26 (Steamline IA)
- 1EMF-27 (Steamline IB)
- 1EMF-28 (Steamline iC)
- 1EMF-29 (Steamline iD)

All SIG levels - STABLE OR INCREASING IN A CONTROLLED MANNER

Determines that 1EMF-33 and 1EMF-27 are in alarm, and IB SIG level is increasing in an uncontrolled manner and informs SRO

SRO Transitions to Step 25 RNO and directs operators.

SRO IE any EMF trip 1 light is lit QB any SIG level is increasing in an uncontrolled manner, fljEN concurrently:

- Implements EPI1/N50001F-0 (Critical Safety Function Status Trees)
- GO TO EPI1/AI50001E-3 (Steam Generator Tube Rupture).

SRO Transitions to EPI1IAI50001E-3 and directs operators.

ROIBOP Monitor Enclosure 1 (Foldout Page)

NUREG-102 1 27 of 38 Rev. S
Appendix 0 Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 1 Event No.: 9-10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior

ROIBOP Identify ruptured SIGs as follows:

- SIG level - INCREASING IN AN UNCONTROLLED MANNER
OR
- Chemistry or RP determines ruptured SIG by frisking the cation columns in the CT lab.
OR
- The following EMF trip 1 lights - LIT:
 - 1EMF-26 (Steamline IA)
 - 1EMF-27 (Steamline IB)
 - 1EMF-28 (Steamline IC)
 - 1EMF-29 (Steamline 10)
- Chemistry determines ruptured SIG using 1 EMF-34 (SIG Sample).
OR
- IF SIG Sampling is required to identify ruptured SIG(s), THEN:
 - a. Ensure the following signals reset:
 - 1) Phase A Containment Isolations
 - 2) CA System valve control
 - 3) KC NC NI NM St signals

- b. Align all SIGs for Chemistry sampling.
- c. Notify Chemistry to sample all SIGs for activity.

RO Verify at least one intact SIG - AVAILABLE FOR NC SYSTEM COOLDOWN.

NUREG-1021 28 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat -just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior

RO Isolate steam flow from ruptured SIGs as follows:

- a. Verify all ruptured SIGs PORV - CLOSED
 - b. Verify SIG(s) I B and 1 C - INTACT
- Determines 1 B SIG is ruptured and informs SRO

SRO Perform the following:

- 1) IE CA Pump #1 is the only source of feedwater, ItQi maintain steam flow to the CAPT from at least one SIG
- Determines this step is N/A and continues in RNO column.
- 2) IE SIG IB is ruptured, THEN:

a) Dispatch two operators to unlock and close 1 SA-1 (Main Steam 18 To CAPT Maintenance Isol) (DH-624, FF-53, Rm 572) (Breakaway lock installed).

b) IF 1 SA-1 cannot be closed, THEN dispatch two operators to unlock and close 1 SA-3 (S/G 1 B SM To CAPT Stop Check) (AM-Sal, DD-53, Rm 217) (Key #589 and #599).

3) IE SIG iC is ruptured, THEN:

Determines that step is N/A.

NUREG-1021 29 of 38 Rev. 8
 Appendix 0 Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B S/G leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicants Actions or Behavior

SRO Transitions to Step 4.c A/ER column and directs operators.

RO C. Isolate blowdown and steam drain on all ruptured SIG(s) as follows:

Determines this step is N/A for SIGs IA, iC, and 10.

SIGiB

- 1) Close 1 SM-76B (SIG 1 B OtIt Hdr Bldwn CN)
- 2) Verify the following blowdown isolation valves - CLOSED:
 - a) 1BB-19A (SIG IB Bldwn Cont Isol Insd)
 - b) 1BB-1 SOB (SIG IB Bldwn Cont Isol Byp)
 - c) 1BB-21B (SIG IB Bldwn Cont Isol Otsd)

RO Close the following valves on all ruptured SIG(s):

(CRITICAL TASK)

- MSIV

- MSIV Bypass valve

EXAMINER NOTE: At some point after SIG I B MSIVs are isolated, SIG pressure will increase to the PORV lift setpoint. When that occurs the PORV will stick open. Isolation of the steam release path is a CRITICAL TASK.

NUREG-1021 30 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG teaks by seat -just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior
 RO/BOP Control ruptured SIG(s) level as follows:

- Verify ruptured SIG(s) NIR level - GREATER THAN 16% (29% ACC).
- Isolate feed flow to all ruptured SIG(s) as follows:

Determines this step is N/A for SIGs IA, 1 C, and 1 D.

S/GIIB:

- 1) Close 1 CA-58A (CA Pmp A Disch To SIG I B Isol)
- 2) Close ICA-54B (CA Pmp 1 Disch To SIG IB Iso)
- c. IF AT ANY TIME ruptured SIG(s) NIR level is less than 16% (29% ACC), IijjN perform step 6.

BOPIRO Verify Pzr PORV and isolation valve status as follows:

- Power to all Pzr PORV isolation valves - AVAILABLE
- All Pzr PORVs - CLOSED
- At least one Pzr PORV isolation valve - OPEN
- IF AT ANY TIME Pzr PORV opens due to high pressure while in this procedure, 'tiN, after Pzr pressure decreases to less than 2315 PSIG, perform Step 7.b (All Pzr PORVs - CLOSED)

RO Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING
- All SIGs - PRESSURIZED

NUREG~1021 31 of 38 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Position Applicant's Actions or Behavior
 ROIBOP Control intact SIG levels as follows:

- Verify NIR level in all intact SIGs - GREATER THAN 11% (29% ACC).
- Throttle feed flow to maintain all intact SIG NIR levels between 11% (29% ACC) and 50%.

C. Ensure CA suction source switchover criterion is monitored.
 REFER TO Enclosure 1 (Foldout Page)

BOP Ensure S/I - RESET:

- ECCS
- DIG load sequencers

C. IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on

BOP Ensure the following containment isolation signals - RESET:

- Phase A
- Phase B

BOP Establish VI to containment as follows:

- Ensures 1VI-77B (VI Cont Isol) - OPEN
- Verify VI pressure - GREATER THAN 85 PSIG

NUREG-1021 32 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat -just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior

BOP Verify all AC busses are energized by offsite power as follows:

• ATrain:

- FTA BIO NORM FDR FRM ATC" - CLOSED
- DIG IA BKR TO ETA" - OPEN
- IETA-ENERGIZED

• BTrain:

- FTB BIO NORM FDR FRM ATD" - CLOSED
- DIG I B BKR TO ETB" - OPEN
- IETB-ENERGIZED.

BOP/RO Verify criteria to stop operating ND pumps as follows:

- At least one ND pump - ON
- NC pressure - GREATER THAN 285 PSIG
- Ensure all ND pump(s) not supporting Cold Leg Recirc - STOPPED
- IF AT ANY TIME NC pressure decreases to less than 285 PSIG in an uncontrolled manner, THEN restart ND pumps

SRO Verify ruptured SIG(s) - IDENTIFIED.

Determines IB SIG is the ruptured SIG.

RO Verify the following valves on all ruptured SIGs - CLOSED:

• MSIV

• MSIV bypass valves

NUREG-1021 33 of 38 Rev. S
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicants Actions or Behavior

RO Verify all ruptured SIGs pressure - GREATER THAN 325 PSIG

BOP WHEN "P-II PZR S/I BLOCK PERMISSIVE" status light (ISI-18) is lit, juiti:

- a. Depress ECCS steam pressure "BLOCK" pushbuttons
- b. Verify main steam isolation blocked status lights (iS-i 3) - LIT
- c. Maintain NC pressure less than 1955 PSIG using one of the following:
 - Pzr spray

OR

- PzrPORV

ALL NOTE: NC Pump trip criteria based on NC subcooling does not apply after starting a controlled cooldown

After the low steamline pressure main steam isolation signal is blocked, Main Steam Isolation will occur if the high steam pressure rate setpoint is exceeded.

NUREG-1021 34 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Applicant's Actions or Behavior

RO EXAMINER NOTE: Cooldown and depressurization to minimize break flow is a CRITICAL TASK.

Initiate NC System cooldown as follows:

- a. Determine required core exit temperature from the table below:

EXAMINER NOTE: Table is attached.

- b. Verify the condenser is available as follows:

- "C-9 COND AVAILABLE FOR STM DUMP" status light (1SI-18) - LIT
- MSIV on intact SIG(s) - OPEN

- c. WHEN "P-12 LO-LO TAVG" status light (1SI-18) is lit, THEN place the steam dump interlock bypass switches in "BYP INTK."

- d. Verify steam dumps - IN PRESSURE MODE
 Determines steam dumps are in "T AVG" Mode and informs SRO.

SRO Transition to Step 19.d RNO and directs operators.

RO Place steam dumps in pressure mode as follows:

- 1) Place "STM DUMP CTRL" in manual.
- 2) Manually adjust the "STM DUMP CTRL" to match "STM DUMP CTRL" demand and "% STM DUMP DEMAND".
- 3) WHEN demand on the "STM DUMP CTRL" is equal to the "% STM DUMP DEMAND", place the steam dumps in pressure mode.

SRO Transition to Step 19.e NER column and direct operators.

RO EXAMINER NOTE: If Main Steam Isolation occurs during the

NUREG-1021 35 of 38 Rev. S
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior
cooldown, the SRO will direct steam to be dumped from intact
SIG PORVs per step 19.e RNO.

RO e. Dump steam to condenser from intact S/G(s) at maximum rate
while attempting to avoid a Main Steam Isolation.

L Verify main steam isolation blocked status lights (1 SI-i 3) - LIT.

9. Verify core exit TICs - LESS THAN REQUIRED
TEMPERATURE.

EXAMINER NOTE: Procedure will loop in Step 19 until the
required temperature is reached per Step 19.g RNO.

h. Stabilize core exit TICs - LESS THAN REQUIRED
TEMPERATURE.

SRO Verify NC System cooldown in Step 19 - COMPLETED.

RO Verify ruptured SIG(s) pressure is under operator control as follows:

- a. All ruptured SIG(s) pressure - STABLE OR INCREASING.
- b. IF AT ANY TIME ruptured SIG(s) pressure is decreasing while in
this procedure, THEN perform Step 21.

RO Verify NC subcooling based on core exit TICs - GREATER THAN
200F.

NUREG-1021 36of 38 Rev. S
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 1 Event No.: 9 - 10

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG
PORV on B SIG leaks by seat -just prior to commencing the NC system cooldown in E-3
(upon reaching peak pressure).

TimePosition Applicant's Actions or Behavior

BOP Depressurize NC System using PZR Spray as follows:

- a. Verify normal Pzr spray flow - AVAILABLE.
- b. Verify Pzr level - LESS THAN 76% (73% ACC).
- c. Depressurize NC System with maximum available spray.
- d. Verify subcooling based on core exit TICs - GREATER THAN
0~ F.
- e. Verify Pzr level - LESS THAN 76% (73% ACC).
- f. Verify NC pressure - LESS THAN RUPTURED SIG(s)
PRESSURE.
- g. Verify Pzr level - GREATER THAN 11% (20% ACC).

EXAMINER NOTE: SRO will loop back through this step until
one of the conditions is met. At that time, the depressurization
will be stopped. The SRO may determine that sprays are not
effectively depressurizing the NCS and transition to Step 23.f
RNO or Step 23.g RNO which transitions to Step 24 AIER and
use Pzr PORVs instead.

Close the following valve(s):

1) Pzr spray valves

2) 1 NV-37A (NV Supply To Pzr Aux Spray)

Observe Caution prior to step 26 and GO TO Step 26.

BOP EXAMINER NOTE: This is Step 24.

Depressurize NC System using PZR PORV.

a. Verify at least one Pzr PORV - AVAILABLE

b. Verify Pzr level - LESS THAN 76% (73% ACC)

c. Open one Pzr PORV.

d. Verify subcooling based on core exit TICs - GREATER THAN
00F

e. Verify Pzr level - LESS THAN 76% (73% ACC)

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat - just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior

- f. Verify NC pressure - LESS THAN RUPTURED SIG(s) PRESSURE
- 9. Verify Pzr level - GREATER THAN 11% (20% ACC)
- h. Close Pzr PORV.
- i. Close Pzr spray valve(s).

EXAMINER NOTE: SRO will loop back through this step until one of the conditions is met. At that time, the depressurization will be stopped.

RO Verify NC Pressure - INCREASING.

ALL CAUTION: S/I must be terminated when termination criteria are satisfied to prevent overfilling the ruptured SIG(S).

RO/BOP Verify S/I termination criteria as follows:

- a. NC subcooling based on core exit TICs - GREATER THAN 00F.
- b. Verify secondary heat sink as follows:
 - NIR level in at least one intact SIG - GREATER THAN 11% (29% ACC).
- OR
- Total feed flow available to SIG(s) - GREATER THAN 450 GPM.
- c. NC pressure - STABLE OR INCREASING.
- d. Pzr level - GREATER THAN 11% (20% ACC).

BOP Stop S/I pumps as follows:

- a. Stop NI pumps.

Event Description: Steam Generator Tube Rupture coincident with manual reactor trip, SIG PORV on B SIG leaks by seat-just prior to commencing the NC system cooldown in E-3 (upon reaching peak pressure).

Time Position Applicant's Actions or Behavior

- b. Ensure only one NV pump - ON
- BOP Verify VI pressure - GREATER THAN 50 PSIG

BOP Isolate NV S/I flowpath as follows:

- a. Verify the following valve - OPEN:
 - 1 NV-252A (NV Pumps Suct From FWST)
 - 1 NV-253B (NV Pumps Suct From FWST)
- b. Verify the following valves - OPEN

- 1NV-203A (NV Pumps A&B Recirc Isol)
- 1NV-202B (NV Pumps A&IB Reciro Isol)

c. Close the following valves:

- 1NI-9A (NV Pmp CIL Inj Isol)
- iNI-IOB (NV Pmp CIL Inj Isol)

TERMINATE SCENARIO WHEN S, FLOWED VERIFIED NOT REQUIRED

Classification: Site Area Emergency per 4.1.S.3 - Potential Loss of Either Nuclear Coolant System or Fuel Clad and Loss of Any Other Barrier. This EAL poses no threat to the safety of plant personnel or the general public.

NUREG-1021 39 of 38 Rev. S
 Appendix D Scenario Outline NRC Set 2 Form ES-D-I
 Simulation Facility: Catawba Scenario No.: NRC-2 Op-Test No: _____

Examiners: _____ Operators: _____

Objectives: To evaluate the applicants' ability to increase power using NOPs while maintaining Tave matched to Tref, and to use AOPs to respond to a failure of a feed water flow transmitter, a VCT level transmitter, loss of the running RN Pump and a spurious opening of a S/a PORV. The applicants will be evaluated using EOPs to respond to a loss of all AC power caused by a loss of offsite power and a failure of the DOs to power the safety busses.

Initial Conditions: Snap 160)
 IA DIG is in Maintenance mode.
 IA ND Pump is tagged out.
 \$10 ID feed water flow, Channel I is 00\$
 Unit 2 is in Mode 5.

Turnover: 50% power 8 EFPD 99lppm [B] 100% CPL Equilibrium Xe
 IAF technicians are calibrating the Channel I S/U ID feed water flow transmitter.
 D/G IA has been tagged out since the last shift for a routine Diesel Day.
 ND Pump IA is tagged for motor oil change. All work is to be completed by the end of this shift.
 Unit 2 is in a forced outage and has just entered Mode 5.
 Enclosure I of OP/I/AI6100/03 has been completed through 2.34.

Thunderstorms are in the area and the load dispatcher has directed that Unit I increase power to 100% as ujekl as ossible due to rid supply problems.

Event No.	Malt;	No.	Event	Event
II	Type*	Description		
1	N/A	N-BOP	Dilute for power increase	
2	N/A	R-RO	Increase power to 100%	
3	xMT~Fo08	1-RO	S/C ID feed water flow transmitter channel II fails high	Sv=120
4	XMT41VOI4	1-BOP	VCT level transmitter fails high	sv=100
5	OVR-RNOIIC	C-BOP	Loss of operating RN pump	OFF
	OVR~NO110			ON
6	MAL4MOO2O	C-RO	\$10 ID PORV fails open	SV=40
7	MAL~POC2	M	Loss of all AC power, station blackout	ALL BKRS
	MAL-EGBCOI			sv=0

NUREG-1021 1 of 29 Rev. 8
 8 MAL-D00056 C-BOP IB DIG field fails to flash
 NUREG-1021 2 of 29 Rev. B
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 1

Event Description: Increase power to 100%

BOP Refer to OP/i /N61 50/009 (Boron Concentration Control) Enclosure 4.3 (Dilution).

BOP Ensure the following valve control switches in "AUTO":

- INV-242A (RMWST To B/A Blender Ctrl)
- 1NV-181A (B/A Blender OtIt To VCT)

BOP Adjust the total makeup batch counter to the desired volume of reactor makeup water to be added.

SOP Place the "NC MAKEUP MODE SELECT" switch to the "DILUTE" position.

SOP Adjust the controller for 1 NV-242A (RMWST To B/A Blender Ctrl) to the desired flow.

BOP Ensure 1NV-242A (RMWST To B/A Blender Ctrl) controller in "AUTO".

SOP Ensure at least one reactor makeup water pump is in "AUTO" or "ON".

NUREG- 1021 3 of 29 Rev. B
 Appendix D Operator Actions Form ES-D-2
 if Position Applicant's Actions or Behavior

BOP NOTE: If necessary, dilution can be manually secured at any time by placing the "NC MAKEUP CONTROL" switch to the "STOP" position.

BOP Place the "NC MAKEUP CONTROL" switch in the "STARr" position.

BOP Verify the following valves open:

- 1NV-242A (RMWST To B/A Blender Ctrl)
- 1NV-1B1A (B/A Blender OtIt To VCT)

BOP If in "AUTO", verify the reactor makeup water pump starts.

BOP When the desired volume of reactor makeup water is reached on the total makeup batch counter, ensure the following valves close:

- 1 NV-242A (RMWST To B/A Blender Ctrl)
- 1NV-181A (B/A Blender Ott To VCT)

If automatic makeup is desired, refer to Enclosure 4.1 (Automatic Makeup).

NUREG-1021 4 of 29 Rev B
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 2

Event Description: Dilute for power increase

Position Applicant's Actions or Behavior

RO Refer to OP/i /B16300/OOI, Turbine Generator, Enclosure 4.2, Section 2.2

RO Depress the "Load Rate" pushbutton and verify it illuminates.

RO Input the desired load rate on the numeric keypad and verify the load rate appears on the Variable Display.

RO Depress the "Enter" pushbutton.

RO Depress the "Target" pushbutton and verify it illuminates.

RO Depress the "Enter" pushbutton.

RO To start load increase, depress the "Go" pushbutton and verify it illuminates.

ALL SIG blowdown changes should be coordinated with Secondary Chemistry.

NUREG-1021 S of 29 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 3

Event Description: S/G 1 D feed water flow transmitter channel II fails high
Time Position Applicant's Actions or Behavior

RO Recognize indications that SIG 1 D feed water flow transmitter channel II failed high based on the following indications and informs the SRO:

- 1AD-4, DIS (DFCS NOT IN AUTO) annunciator- LIT
- 1CFP 5070 failed to off-scale - HIGH
- SIG 1 D feed water controllers swapped to manual

RO Refer to OP/11BI6100IO1OE (Annunciator Response For Panel 1AD-4) Section D15 and perform actions.

EXAMINER NOTE: Annunciator response is attached.

RO Control S/G level and CF flow by manual operation of controllers.

BOP Notify IAE to determine and correct cause of DFCS malfunction.

EXAMINER NOTE: This will not be repaired for the remainder of the scenario and manual control will be required.

NUREG-1021 6 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 4

Event Description: VCT level transmitter fails high

TimePosition Applicant's Actions or Behavior

BOPRecognize indications that VCT level transmitter 1NVP5760 failed high based on the following indications and informs SRO:

- 1AD-7, H/i (VCT HI LVL) annunciator - LIT
- Computer alarm screen indicates 1NVP5760 at 100%
- Computer alarm screen for 1 NV-i 72A (3 Way Divert To

VCT-RHT) in alarm

BOP Refer to OP/i IB/6100/O1OH (Annunciator Response For Panel 1AD-7) Section H/i (VCT HI LVL) and performs actions.

EXAMINER NOTE: Annunciator response is attached.

EXAMINER NOTE: This will not be repaired for the remainder of the scenario.

NUREG-1021 7 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2
Time Position Applicant's Actions or Behavior

BOP Recognize indication for loss of operating RN Pump and informs SRO.

- 1AD-12, A/2 (RN ESSENTIAL HDR A PRESSURE - LO) annunciator LIT
- IAD-i 2. A15 (RN ESSENTIAL HDR B PRESSURE - LO) annunciator LIT

EXAMINER NOTE: Annunciator Response is attached.

EXAMINER NOTE: BOP may start an idle RN pump per the annunciator response procedure.

EXAMINER NOTE: Starting an idle RN pump is a CRITICAL STEP.

SRO Implements APIOIA'5500120 (Loss of Nuclear Service Water) and directs operators.

BOP Start idle RN Pumps as required.

RO Ensure Unit 1 and Unit 2 OATC monitors Enclosure 1 (Foldout Page).

BOP Verify each operating RN pump discharge flow - GREATER THAN 8,600 GPM.

BOP Verify each operating RN pump discharge flow - LESS THAN 23,000 GPM.

BOP Ensure RN pumps - IN OPEIRATION AS NEEDED.

NUREG-1021 S of 29 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 5

Event Description: Loss of operating RN Pump

ifi Position Applicant's Actions or Behavior

BOPEnsure proper alignment of RN to KC Hxs as follows:

- Verify RN - ALIGNED TO IN SERVICE KC HX(S).
- Ensure KC Hx OtIt Mode switches - PROPERLY ALIGNED.

BOP Verify each operating RN pump discharge flow - GREATER THAN

BOP Verify RN available to all Unit 1 and Unit 2 DIG(s).
BOP Determine VCIYC status as follows:

- Verify VCIYC - ALIGNED TO OPERATING RN TRAIN.
- Verify YC Chiller - RUNNING.

ALL Determine and correct loss of RN train.
iruasa- 1021 9 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

LOp-Test No.: NRC ScenarioNo.:2 EventNo.:5

Event Description: Loss of operating RN Pump

Position Applicant's Actions or Behavior

SRO Ensure compliance with appropriate Tech Specs:

- 3.6.5 (Containment Air Temperature)
- 3.6.6 (Containment Spray System)
- 3.6.17 (Containment Valve Injection Water System)
- 3.7.5 (Auxiliary Feedwater System)
- 3.7.7 (Component Cooling Water System)
- 3.7.8 (Nuclear Service Water System)
- 3.7.10 (Control Room Area Ventilation System)
- 3.7.11 (Control Room Area Chilled Water System)
- 3.8.1 (A.C. Sources - Operating)
- 3.8.2 (A.C. Sources - Shutdown)

SRO Determine required notifications:

- REFER TO RP/0IA/50001001 (Classification of Emergency)
- REFER TO RPIOIBI5000IO1 3 (NRC Notification Requirements)

BOP Notify Environmental Chemistry of any RN pump shifts that have occurred.

ALL Determine long term plant status. RETURN TO procedure in effect.
NUREG-1021 10 of 29 Rev. S
Appendix 0 Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 6

Event Description: SIG 10 PORV fails to intermediate position

Time Position Applicant's Actions or Behavior

RO Recognize indication that SIG 1 D PORV failed open and informs SRO.

isv-i (SIG iD PORV) indicates OPEN.

EXAMINER NOTE: OMP 1-7 allows RO to isolate a known leak without SRO permission and inform SRO of isolation actions performed.

SRO Directs RO to close isv-i (SIG 10 PORV)

RO Attempts to close PORV by:

- Places "SG 1 D PORV CTRL MODE" switch in "MANUAL" position.
- Positions isv-i (SIG 10 PORV) controller to zero output.

Inform SRO SIG 10 PORV will not go CLOSED.

SRO Directs RO to close 1 SV-25B (SIG 1 D PORV ISOL).

RO Places 1 SV-25B (SIG 1 D PORV ISOL) in the "CLOSE" position.
Informs SRO that SIG iD RORV isolation valve is CLOSED.

SRO Refers to Tech Specs:

- TS 3.6.3 (Containment Isolation Valves)

TS 3.7.4 (Steam Generator Power Operated Relief Valves (SG PORVs))

EXAMINER NOTE: SRO may implement AP111X5500128 (Secondary Steam Leak) at this point but it is not required. Required actions are on the subsequent pages of this section.

NUREG-1021 11 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 6

Event Description: SIG 1 D PORV fails to intermediate position

Time Position Applicant's Actions or Behavior

EXAMINER NOTE: The following actions are provided in case the SRO enters APIIIA'5500128 (Secondary Steam Leak).

SRO Implements AP/11AI5500128 (Secondary Steam Leak) and directs operators.

OATC Monitor Enclosure 1 (Foldout Page).

RO Verify turbine - ONLINE.

RO Verify the following:

- Reactor power - LESS THAN OR EQUAL TO 100% POWER.

- I-avg-WITHIN 1.50F OFT-Ref

RO Verify proper reactor response as follows:

- Control rods - IN "AUTO" AND STEPPING IN

- PIR neutron flux - DECREASING.

ALL IF AT ANY TIME reactor power is greater than 100%, THEN

perform Step 3 RNO.

RO Verify Pzr level - STABLE OR INCREASING.

ALL IF AT ANY TIME Pzr level is decreasing in an uncontrolled manner,

NUREG-1021 12 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 6

Event Description: SIG 1 D PORV fails to intermediate position

Time Position Applicant's Actions or Behavior

THEN RETURN TO Step 6.

BOP IF AT ANY TIME VCT level goes below 23%, THEN align NV pump suction to FWST as follows:

a. Open the following valves:

- 1NV-252A (NV Pumps Suct From FWST)

- 1NV-253B (NV Pumps Suct From FWST).

b. Close the following valves:

- INV-188A (VCT OtIt Iso)
- 1 NV-i 89B (VCT OtIt Isol).

ALL Attempt to identify and isolate leak as follows:

- a. Verify the following conditions - NORMAL
- Containment temperature
 - Containment pressure
 - Containment humidity
 - Containment floor & equipment sump level.

b. Dispatch operators to locate and identify source of steam leak.

RO c. Verify SIG PORVs - CLOSED.

 Informs SRO that 1 D SIG PORV is NOT CLOSED.

SRO Transitions to Step 9.c RNO.

NUREG-1021 13 of 29 Rev. S
Appendix D Operator Actions Form ES-ID-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 6

Event Description: SIG 1 D PORV fails to intermediate position

ifi Position Applicant's Actions or Behavior

RO C. IF SIG pressure is less than 1090 PSIG, THEN perform the following:

- 1)Close affected SIG PORV.
- 2)IF SIG PORV is still open, THEN:
 - a) Close affected SIG PORV isolation valve.

RO Informs SRO that iD SIG PORV isolation valve is closed.

SRO Transitions to Step 9.d A/ER column.

RO d. Verify condenser dump valves - CLOSED.

- e. Verify atmospheric dump valves - CLOSED.
- f. Verify CAPT #1 - OFF.
- g. IF leak is suspected to be in the doghouse, THEN close the following valves:
Outside OH:

- 1SM-74B (SIG IB Ott Hdr Bldwn CN)
- 1SM-75A (SIG iC Ott Hdr Bldwn CN).

SRO Determine required notifications:

- REFER TO RPIO/A'50001001 (Classification of Emergency)
- REFER TO RPIOIBI5000IOI 3 (NRC Notification Requirements).

BOP Notify RP of leak.

NUREG-1021 14 of 29 Rev. B
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 6

Event Description: SIG 1 D PORV fails to intermediate position

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B D/G field fails to flash.

Ljlkftion Applicant's Actions or Behavior

EXAMINER NOTE: Main Generator will trip approximately 5 seconds after loss of switchyard resulting in a loss of both onsite and offsite power.

ALL Recognize indications of a loss of the switchyard followed by a loss of in-house power:

- Control rods stepping in, (then reactor trip)
- Speed I megawatt meter shifts to speed indication, (then turbine trip)
- Steam dumps open
- NCPORVs open

EXAMINER NOTE: SRO may enter E-O initially, but will transition to ECA-O.O at Step 4 of E-O.

SRO Implements EPI1/A/5000/ECA-O.O (Loss of All AC Power) and directs the operators.

SRO CSF Status trees should be monitored for information only. Do not exit this procedure to implement any of the CSF procedures.

RO Verify Reactor Trip:

- All rod bottom lights - LIT
- All reactor trip and bypass breakers - OPEN
- hR amps - DECREASING

NUREG-1021

16 of 29

Rev. B

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and B

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.

Time Position Applicant's Actions or Behavior

RO Verify Turbine Trip:

- All Turbine Stop valves - CLOSED
- All Turbine Control valves - CLOSED.

BOP Establish NC pump seal injection from the SSF: (CRITICAL TASK)

- Notify Security Officer at SSF to perform Enclosure 2 (Establishing NC Pump Seal Injection From the SSF).
- Dispatch operator to 1 ETA switchgear room to swap power supply for 1 EMXS. REFER TO Enclosure 1 (Swapping Power Supply for 1 EMXS).
- Dispatch operator to SSF to establish NC pump seal injection. REFER TO Enclosure 2 (Establishing NC Pump Seal Injection From the SSF).

BOP Verify NC System is isolated as follows:

- a. All Pzr PORVs - CLOSED.
- b. All the following letdown isolation valves - CLOSED
 - 1NV-10A (Letdn Orif IB Cont Isol)
 - 1NV-1 IA (Letdn Orif iC Cont Isol)
 - 1NV-13A (Letdn Orif IA Cont Isol)
 - 1NV-1A (NC Letdn To Regen Hx Isol)
 - 1NV-2A (NC Letdn To Regen Hx Iso)
 - 1NV-135 (ND Flow To Letdn Hx).

BOP Determines that 1NV-1A and 1NV-2A are not closed and informs SRO.

NUREG- 1021 17 of 29 Rev. S
 Appendix D Operator Actions Form ES-D-2
 TimePosition Applicant's Actions or Behavior
 SRO Transitions to Step 5.b RNO column and continues.
 SOP Manually close valves.

SOP Manually closes 1NV-1A and 1NV-2A and informs SRO.

SRO Transitions to Step S.c NER column and continues.
 BOP c. All the following excess letdown isolation valves - CLOSED:

- 1NV-1228 (Loop C To Exs Letdn Hx Iso)
- 1NV-123B (Loop C To Exs Letdn Hx 1501)
- 1NV-124B (Excess letdn Press Ctrl).

BOP Verify total CA flow - GREATER THAN 450 GPM.
 SOP Attempt to restore power to 1 ETA or 1 ETS as follows:

- a. Manually start DIGs from control room.
- b. Verify DIG load sequencer-AUTOMATICALLY LOADING BUS.

BOP Determines that DIG IB is running but DIG IB breaker is open and sequencer is not loading the bus and informs SRO.

SRO Transitions to Step 7.b RNO and directs operators.
 NUREG-1021 16 of 29 Rev. S
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.
 Time Position Applicant's Actions or Behavior

BOP Perform the following for the affected train(s):

- 1 ETA (Not available)

EXAMINER NOTE: IETA will be the bus that will be returned later in the scenario, but currently without power.

- 1ETB:
- 1) IE 1 ETB is de-energized, THEN:
 - a) Ensure the following breakers - OPEN:
 - "ETB NORM FDR FRM ATD"

- "ETB ALT FDR FRM SATB".

b) IF 1 ETB is still de-energized, THEN:

- (1) Depress and hold the DIG "OFF" pushbutton.
- (2) Dispatch operator to open 1 EDF-FO1 F (Diesel Generator Load Sequencer Panel 1 DGLSB) (AB-560, BB-46, Rm 372).
- (3) WHEN 1EDF-FO1F is open, THEN release the DIG "OFF" pushbutton.

SRO Transitions to step 7.c NER column and continues.

BOP C. Verify 1ETAor 1ETB- ENERGIZED.

Determines that neither bus is energized and informs SRO.

SRO Transitions to Step 7.c RNO.

SRO GO TO Step 8.

NUREG-1021 19 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.

TimePosition Applicant's Actions or Behavior

SRO Transitions to Step 8 AIER column and continues.

BOP Verify CA supply is adequate as follows:

- VI pressure - GREATER THAN 85 PSIG.
- Ensure proper CA pump suction supply, REFER TO AP/1kl5500106 (Loss Of SIG Feedwater).

SRO Implement RP/01N5000101 (Classification Of Emergency).

ALL WHEN power is restored to one essential bus, THEN GO TO Step 31.

BOP Verify S/I status as follows:

- "SAFETY INJECTION ACTUATED" status light (1SI-13) - LIT. Determines that light is NOT lit and informs SRO.

SRO Transitions to Step 11 .a RNO and directs operators.

SRO Perform the following:

- IF AT ANY TIME an S/I signal is generated while in this procedure, THEN, after the 1 minute time delay, reset ECCS.

2) GOTOSTep12.

BOP/SRO Dispatch operator with a screwdriver to load shed essential busses and verify lockout relay status. REFER TO Enclosure 4 (Manual Load Shed of 1 ETA and 1 ETB).

NURHG-1021 20 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC ScenarioNo.:2 EventNo.:7and8

Event Description: Loss of all AC power, station blackout; 1B DIG field fails to flash.

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NUREG-1021 21 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Lop-Test No.: NRC ScenarioNo.:2 EventNo.:7and8

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.

Time Position Applicant's Actions or Behavior
BOP/SRO Restore power to at least one essential bus as follows:

a. Dispatch operator and maintenance IAE personnel to DIG rooms to prepare DIGs for start. REFER TO the following:

- Enclosure 20 (Local Start of Diesel Generator IA)
- Enclosure 2i (Local Start of Diesel Generator IB).
- EM/1IAI52001003 (Troubleshooting Cause For a Diesel Generator Failing to Start)

b. Verify switchyard - ENERGIZED.

C. WHEN time and manpower permit, THEN perform Enclosure 22 (Switchyard Battery Conservation).

NOTE: Ofsite power may be unavailable for reasons other than switchyard de-energized.

d. Verify at least one of the following power sources available:

- Offsite Power
OR
- DIGIA
OR
- DIGiB

e. Verify offsite power - AVAILABLE.

EXAMINER NOTE: Crew may determine that offsite power is available however, the intent is to restore power from IA DIG. Whether the crew responds that offsite power is available or is

NOT available, the final result will be the same.

In the former case, they will be directed to restore power from offsite per Enclosure S (Restoration of Offsite Power) and in step i of that enclosure, the dispatcher will inform them NOT to reconnect to the switchyard at this time. For the latter case, Step 13.e RNO directs the crew to restore power to one essential bus per Enclosure 5 (Power Restoration From DIGs).

NUREG-1021 22 of 29 Rev. 6
Appendix ID Operator Actions Form ES-D-2

Op-Test No.: NRC ScenarioNo.:2 EventNo.:7and8

Event Description: Loss of all AC power, station blackout; 1 B D~G field fails to flash.

Time Position Applicant's Actions or Behavior
NUREG-1021 23 of 29 Rev. B
Appendix 0 Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B D/G field fails to flash.

Time Position Applicant's Actions or Behavior

SRO Transitions to Step 14 A/ER column and directs operators.

SOP Verify one train of VCIYC - OPERATING.

Determines neither train of VCIYC is in service and informs SRO.

SRO Transitions to Step 14 RNO and directs the operators.
BOP/SRO Perform the following:

- a. Request IAE to open the doors on control room cabinets within 30 minutes of the loss of power. REFER TO Enclosure 9 (Control Room Cabinet Doors to Open).
- b. IF Unit 2 power is available, THEN notify the Unit 2 Supervisor to dispatch operator to align Unit 2 power to 1 EMXG and 2EMXH as follows:

NOTE: The following breakers are kirk-key interlocked.

EXAMINER NOTE: The following would be performed by Unit 2 personnel. Steps will not be completed for this scenario.

- 1EMXG:

- 1) Open 1 EMXG-FO3A (Incoming Breaker Fed from Unit 1 Load enter 1 ELXA).
- 2) Close 1EMXG-FO6A (Incoming Breaker Fed From Unit 2 Load Center 2ELXA).
- 3) Close 2ELXA-5B (MCC I EMXG Unfl 2 Feeder).

- 2EMXH:

- 1) Open 2EMXH-FOSA (Incoming Breaker Fed From Unit 1 Load Center 1ELXB).
- 2) Close 2EMXH-FO3A (Incoming Breaker Fed From Unit 2 Load Center 2ELXB).
- 3) Close 2ELXB-5B (MCC 2EMXH Unit 2 Feeder)

NUREG-1021 24 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.

Time Position Applicant's Actions or Behavior

BOP C. Place one train of VCIYC in service with power from Unit 2. REFER TO 0P101N645011 1 (Control Room Area Ventchilled Water System).

d. WHEN one train of VCIYC is returned to service, THEN close the cabinet doors previously opened.

ROIsolate NC pump seals as follows:

a. Notify operator at SSF to ensure 1 NV-89A (NC Pmps Seal Ret Cont Isol) - CLOSED.

b. Notify operator at SSF to verify standby makeup pump - ON.

ROVerify SIGs are isolated as follows:

a. Verify the following SM valves - CLOSED:

- AIIMSIVs

- All MSIV bypass valves.

SRO Transitions to Step 16.a RNO and directs the operators.
RO Perform the following:

- 1) Manually close valve(s).

Manually closes all MSIVs and MSIV bypasses and informs SRO.

RO b. Verify the following CF valves - CLOSED:

- All CF control valves
- All CF bypass control valves.

c. Verify all blowdown flow control valves - CLOSED.

NUREG-1021 25 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event NQ.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B DIG field fails to flash.

MI Position Applicant's Actions or Behavior

RO d. Dispatch operator to close the following valves:

- 1SM-77A (SIG IA OtIt Hdr Bldwn CN)
- 1SM-768 (SIG IB OtIt Hdr Bldwn CN)
- 1SM-75A (SIG iC OtIt Hdr Bldwn CN)
- 1SM-74B (SG iD OtIt Hdr Bldwn CN).

RO Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING
- All S/Gs - PRESSURIZED.

BOP Verify SIG tubes are intact as follows:

The following EMF trip 1 lights - DARK:

- 1EMF-26 (Steamline IA)
- 1EMF-27 (Steamline IB)
- 1EMF-28 (Steamline iC)
- 1EMF-29 (Steamline iD)
- 1 EMF-33 (Condenser Air Ejector Exhaust)
- 1EMF-34 (SIG Sample).

EXAMINER NOTE: At this point, the operator at the IA DIG will call the Control Room to inform them that the DIG is ready to start per Enclosure 20. The crew will return to step 13 and restore power per Enclosure 5. Once power is restored to I ETA, the crew will immediately transition to Step 31 and the scenario will be terminated. (CRITICAL TASK)

NUREG-1021 26 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Time Position Applicant's Actions or Behavior

RO Control intact S/G levels as follows:

- Maintain total CA flow from CA Pump #1 less than 1000 GPM while feeding SIG(s) in the following steps.
- Verify CA flow to all intact SIGs - INDICATING FLOW.
- Verify NIR level in all intact SIGs - GREATER THAN 11% (29% ACC).
- Throttle CA flow from the control room to maintain SIG NIR level in all intact SIGs between 11% (29% ACC) and 50%.
- IF AT ANY TIME NR level in any SIG increases in an uncontrolled manner, THEN:

EXAMINER NOTE: The remainder of this step is NIA.

BOP Reduce nonvital DC loads as follows:

a. Dispatch operator to open breakers for Group A, large nonvital DC loads. REFER TO Enclosure 12 (DC Loads to be Shed During Loss of All AC Power), Step 1.

b. WHEN the large nonvital DC loads are removed, THEN notify operator to open additional breakers to maintain the required voltage on the following "DIST CTR VOLTS" meters (1 MC-8). REFER TO Enclosure 12 (DC Loads to be Shed During Loss Of All AC Power), Step 2:

- 1CDA greater than 105 volts
- 1 CDB greater then 1 Os volts
- 1 DPD greater than 210 volts.

NUREG-1021 27 of 29 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B D/G field fails to flash.

[Time Th~ositionI Applicant's Actions or Behavior

BOP Verify criteria requiring NC System cooldown and depressurization as follows:

- Standby makeup pump - OFF
OR
- Pzr level - DECREASING IN AN UNCONTROLLED MANNER.

NUREG- 1021 26 of 29 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; 1 B D/G field fails to flash.

Time Position Applicant's Actions or Behavior

BOP Verity the following Monitor Light Panel Group 5 St lights - LIT:

a. VP, VQ, and VY:

- G-1orG-11
- G-2orG-10
- G-3 or G-9
- G-4 or G-5
- G-5 or G-7
- H-2orH-10
- H-3 or H-9
- H-4 or H-8
- H-S or H-7
- H-il or 1-2
- 1-3 or 1-10
- 1-6 or 1-7

c. VUCDT:

- L-12 or M-1

Determines that VUCDT lights are both dark and informs SRO

SRO Transitions to Step 22.b RNO and directs the operators.

BOPISRO Dispatch operator to locally close outside containment isolation valve for affected penetration. REFER TO Enclosure 16 (Local Isolation of Phase B Isolation Valves).

NUREG-1021 29 of 29 Rev. B
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 2 Event No.: 7 and 8

Event Description: Loss of all AC power, station blackout; IB DIG field fails to flash.

Time Position Applicant's Actions or Behavior

ALL CAUTION: Lowering SIG pressures less than 65 PSIG will cause injection of nitrogen from the CLAs into the NC System.

NOTE: Pzr level may be lost and reactor vessel head voiding may occur due to depressurization of SIGs.

RO Depressurize intact SGs to 165 PSIG as follows:

- a. Verify SIG NIR level in at least one intact SIG - GREATER THAN 11% (29% ACC).
- b. Ensure operator monitors Enclosure 13, (SIG Depressurization Limits) throughout the SIG depressurization.
- c. Dump steam from all intact SIG PORVs at maximum rate.
EXAMINER NOTE: A SIG is isolated because of leaking PORV and should not be used during the cooldown.
- d. Verify all NC T-Colds - GREATER THAN 2800F.
- e. Maintain at least one intact SIG NIR level greater than 11% (29% ACC).
- f. Verify all intact SIG pressures - LESS THAN 165 PSIG.

RO Determines all intact SIG Pressures are not less than 165 psig and informs SRO.

SRO Transitions to 23.f RNO and directs operators

- 1) WHEN all intact SIG pressures are less than 165 PSIG, THEN perform Step 23.g.
- 2) ~GOfIOStep24.

SRO Transitions to Step 24 AIER column and directs operators.

NUREG-1021 30 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC ScenarioNo.:2 EventNo.:7and8

Event Description: Loss of all AC power, station blackout; IB DIG field fails to flash.

Time Position Applicant's Actions or Behavior

RO Verify the reactor is subcritical as follows:

- IR SUR - ZERO OR NEGATIVE
- S/R SUR - ZERO OR NEGATIVE.

BOPVerify S/I signal status as follows:

- a. Verify SI! - HAS BEEN ACTUATED
- b. After 1 minute time delay, reset ECCS.

BOP Verify Phase A Containment Isolation as follows:

- a. Phase A "RESET" lights - DARK

b. Monitor Light Panel Group 5 St lights - LIT.
Determines that Monitor Light Panel is not in proper alignment and informs SRO.

SRO Transitions to Step 26.b RNO and directs the operators.

BOP Perform the following:

1) Manually close valves

2) IL valves cannot be closed, THEN dispatch operator to close affected outside containment isolation valves. REFER TO Enclosure 15 (Local Isolation of Phase A Isolation Valves).

SRO Transitions to Step 27 A/ER column and directs the operators.

NUREG-1021 31 of 29 Rev. B
Appendix D Operator Actions Form ES-D-2
Time Position Applicant's Actions or Behavior

BOP Verify containment pressure - HAS REMAINED LESS THAN 3 PSIG.

Ensure H2 recombiners remain de-energized on power restoration as follows:

a. Verify H2 recombiners - HAVE BEEN PLACED IN SERVICE.

Determines that H2 recombiners have not been placed in service and informs SRO.

SRO Transitions to Step 28.a RNO and then goes to Step 29.

BOP Verify containment radiation levels are normal as follows:

- 1 EMF-53A (Containment Train A) - LESS THAN 10 R'HR

- 1 EMF-53B (Containment Train B) - LESS THAN 10 R'HR.

RO Verify Core exit TICs - LESS THAN 1 2000F.

BOP Verify either 1 ETA or 1 ETB undervoltage status lights (1SI-14) - DARK.

EXAMINER NOTE: DIG IA should be running and supplying 1 ETA prior to reaching this step due to earlier directions to restore power per Enclosure 20 (Local Start of Diesel Generator IA).

TERMINATE SCENARIO WHEN POWER RESTORED TO IETA

NUREG-1021 32 of 29 Rev. 8

Classification: SITE AREA EMERGENCY - 4.5.S.1 - All AC electrical power to the vital busses (Offsite and Onsite) has been lost for more than 15 minutes. This condition, by itself posed no immediate threat to public safety.

NUREG-1021 33 of 29 Rev. S
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRCScenario No.: 3 Event No.: 1

Event Description: Boration for load decrease

Time [ffl~osition Applicant's Actions or Behavior

- INV-238A (B/A Xfer Pmp To Blender Ctrl)
- 1NV-186A (B/A Blender OtIt To VCT Ott)

BOP Adjust the boric acid batch counter to the desired volume of boric acid to be added.

BOP Place the "NC MAKEUP MODE SELECT" switch in "BORATE".

BOP Adjust the controller for 1 NV-238A (B/A Xfer Pmp to Blender Ctrl) controller to the desired flow.

BOP Ensure 1 NV-238A (B/A Xfer Pmp to Blender Ctrl) controller in "AUTO".

BOP NOTE: If necessary, Boration can be manually secured at any time by placing the "NC MAKEUP CONTROL" switch to "STOP" position.

Ensure at least one boric acid transfer pump in "AUTO" or "ON".

BOP Place the "NC MAKEUP MODE SELECT" switch in "START" position.

BOP Verify the following valves open:

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl VIv)
- 1 NV-i 86A (B/A Blender Ott To VCT Ott)

NUREG-1021 1 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRCScenario No.: 3 Event No.: 1

Event Description: Boration for load decrease
[ifflime Position Applicant's Actions or Behavior

BOP When the desired volume of boric acid is reached on the boric acid batch counter, ensure the following valves close:

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv)
- 1NV-186A (B/A Blender OtIt To VCT OtIt)

BOP IF desired, flush the makeup line as follows:

- Open the following valves:
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - I NV-i 86A (B/A Blender OtIt To VCT OtIt)
- Ensure one reactor makeup water pump is in "ON".

• WHEN 20 gallons of makeup water have been flushed through the makeup line, close the following valves:

- I NV-242A (RMWST To B/A Blender Ctrl)
- 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)
- Place the following valve control switches in "AUTO":
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)
- IF NOT required for current plant operation, place the reactor makeup water pump started in earlier step in "AUTO".

Op-Test No.: NRC Scenario No.: 3 Event No.: 2

Event Description: Decrease turbine load

Position Applicant's Actions or Behavior

RO Refer to OPI1/B163001001, Turbine Generator, Enclosure 4.2, Section 2.4

RO Depress the Load Rate" pushbutton and verify it illuminates.

RO Input the desired load rate on the numeric keypad and verify the load rate appears on the Variable Display.

RO Depress the "Enter" pushbutton.

RO Depress the "Target" pushbutton and verify it illuminates.

RO Input the desired load target on the numeric keypad and verify the load target appears on the Target Display.

RO Depress the "Enter" pushbutton.

RO To start load decrease, depress the "Go" pushbutton and verify it illuminates.

RO SIG Blowdown changes should be coordinated with Secondary Chemistry.

Op-Test No.: NRC Scenario No.: 3 Event No.: 3

Event Description: Tc Fails to 630 0F. (This instrument failure will cause the Control Rods to step in at maximum rate).

Time Position Applicant's Actions or Behavior

RO/BOP Recognizes unwarranted rod motion and places rods to manual.
Refers to Annunciator Response and Required Actions per:

1AD-2 A14 and 1AD-6 N6,B/6,C16

EVALUATOR NOTE: The Annunciator Response is attached.

SRO May determine transition to API1/N5500/i5 is appropriate, Case II.

SROIRO Ensure "CRD BANK SELECT" switch - IN MANUAL.

RO Verify all rod motion - STOPS

RO Manually adjust control rods as necessary to maintain T-Avg within 10F of T-Ref

SRO/RO Determine and correct cause of continuous rod movement

SRO Ensure compliance with appropriate Tech Specs:

- 3.1.1 (Shutdown Margin (SDM))
- 3.1.4 (Rod Group Alignment Limits)
- 3.1.5 (Shutdown Bank Insertion Limits)

- 3.1.6 (Control Bank Insertion Limits)

NUREG-1021 4 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 3

Event Description: Tc Fails to 630 OF. (This instrument failure will cause the Control Rods to step in at maximum rate).

Time Position Applicant's Actions or Behavior
 SRO Determine required notifications:

- REFER TO RP/0/AI50001001 (Classification Of Emergency)
- REFER TO RP/0/BIEOOIO1 3 (NRC Notification Requirements)

Determine long term plant status.
 RETURN TO procedure in effect.

NUREG-1021 5 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 4

Event Description: NC Pump Seal Injection Flow Meter Fails LOW (1NVP5650)

Time Position Applicant's Actions or Behavior

BOP Recognizes 1 NV-309 failing closed and takes valve to manual based on SRO direction.

SRO Directs activities of BOP.

BOP Refers to annunciator response and required actions per

- 1AD-7. E/1, E/2. and F/3.

SRO Calls SPOC and reports failure of NC Pump Seal Injection flow meter. (1 NVPE650)

NUREG-1021 6 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 5

Event Description: NCS Leak (= 90 GPM)

Time Position Applicant's Actions or Behavior

ALL Recognize increase in Containment Activity/Humidity/Pressure/OAC alarm for unidentified leakage in containment.

RO Verify Pzr level - STABLE OR INCREASING

Determines Pzr pressure is decreasing and informs SRO.

SRO Determines Transition to step 2 RNO required

NUREG-1021 7 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 5

Event Description: NCS Leak (E 90 GPM)

Time Position Applicant's Actions or Behavior

Perform the following:

- a. Maintain charging flow less than 180 GPM
- b. Manually throttle 1 NV-294 (NV Pmps A&B Disc Flow Ctrl) to stabilize Pzr level
- c. IF Pzr level is stable OR increasing, THEN GO TO Step 3. SRO determines pressure is still decreasing and continues in RNO.
- d. If Pzr level continues to decrease. THEN:
 - 1) Reduce letdown flow to 45 GPM as follows:
 - a) Manually control 1NV-148 (Letdn Press Control) to maintain letdown pressure at 350 PSIG
 - b) IF 1NV-13A (Letdn Orif IA OtIt Cont Isol) is open, THEN perform the following:
 - (1) Open 1NV-11A (Letdn Orif iC OtIt Cont Isol)
 - (2) Close 1 NV-i 3A (Letdn Orif 1 A OtIt Cont Isol)
 - c) IF 1NV-10A is open, THEN throttle 1NV-849 until letdown flow is 45 GPM.
 - d) WHEN letdown pressure is stable at 350 PSIG, THEN place 1NV-148 (Letdn Press Control) in "AUTO"

SRO IF Pzr level continues to decrease, THEN ensure the following valves closed:

SRO determines this step is N/A and continues.

SRO IF Pzr level is stable OR increasing, THEN GO TO step 3

ALL IF AT ANY TIME the NC System leak increases, THEN perform step 2
NUREG-1021 8 of 32 Rev. S
Appendix D Operator Actions Form ES-D-2
II] Position Applicant's Actions or Behavior

RO Verity Pzr pressure - TRENDING TO OR STABLE AT 2235 PSIG

SROIBOP Dispatch operator(s) to locate and isolate NC System leak

EXAMINER NOTE: The crew will not send an operator to look for this since, based on indications, it is in containment.

BOP IF AT ANY TIME 1AD-7, Ii 'VCT LO LVL'1 alarm is lit, THEN align NV pump suction to the FWST as follows:

SRO evaluates step as currently not applicable and continues.

RO Determine NC leak rate by any of the following methods:

- Compare charging flow and letdown flow

OR

- Monitor OAC NV graphic

OR

- Initiate OAC Program "NSNCLEAK"

OR

- Monitor OAC point EROPLEAK

OR

- Monitor OAC point CI P0976 (Gross NC System Leak Rate, Ten Mm Run Avg)

RO Verify auxiliary building radiation is normal as follows:

- EMF-41 (Aux Bldg Ventilation) - TRIP 1 LIGHT DARK AND COUNTRATE STABLE
- All area monitor EMF trip 1 lights - DARK

NUREG-1021 9 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 5

Event Description: NCS Leak (= 90 GPM)

Fm Position Applicant's Actions or Behavior

ALL NOTE: Letdown flow and pressure are monitored between the Letdown HX and 1 NV-i 48 (Letdn Press Control)
SROIBOP Verify letdown lines - INTACT

BOP Verify the following NC pump thermal barrier alarms - DARK:

- iAD-6, Eli, "NCP THERMAL BARRIER KC OUTLET HI/LO FLOW"
- 1AD-6, E/2 "NCP B THERMAL BARRIER KC OUTLET HI/LO FLOW"
- 1AD-6, E13, "NCP C THERMAL BARRIER KC OUTLET HI/LO FLOW"
- 1AD-6, E14, "NCP D THERMAL BARRIER KC OUTLET HI/LOW FLOW"

SOP Verify 1 EMF-46A and 1 EMF-46B (Component Cooling) - TRIP 1

BOP Verify containment conditions are normal as follows:

- Containment EMF - Trip 1 LIGHTS DARK AND COUNTRATE STABLE:
- iEMF38 (Containment Paniculate)
- 1EMF3Q (Containment Gas)
- 1 EMF4O (Containment Iodine)
- Containment floor and equipment sump level(s) - STABLE

NUREU-1021 10 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2

if Position Applicant's Actions or Behavior

SRO Determines transition to step 12 RNO appropriate

BOP Stop any VO releases in progress. REFER TO 0P111N64501017 (Containment Air Release and Addition.

SRO Transition to Step 13 A/ER column and continues.

BOP Verify NCDT conditions are normal as follows:

- NCDT pressure - STABLE
- NCDT level - STABLE
- NCDT discharge flow - EQUAL TO RECIRC FLOW

- NCDT temperature - STABLE
- BOP Verify PRT conditions are normal as follows:
- PRT pressure - LESS THAN 8 PSIG
 - PRT level - LESS THAN 89%
 - PRT temperature - LESS THAN 1 300F

SRO Ensure compliance with appropriate Tech Specs and Selected Licensee Commitments Manual:

- 3.4.13 (RCS Operational Leakage)
- 3.4.14 (RCS Pressure Isolation Valve (PIV) Leakage)
- 3.5.5 (Seal Injection Flow)
- 3.7.17 (Secondary Specific Activity)
- SLC 16.7-9 (Standby Shutdown System)

SRO Determine required notification:

- REFER TO RP/OIA/5000IOO1 (Classification Of Emergency)
- REFER TO RP/O/B15000101 3 (NRC Notification Requirements)

NUREG-1021 11 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 LVI Position Applicant's Actions or Behavior

ALL Verify NC System leak - ISOLATED

Determines transition to step 17 RNO appropriate:

SRO/BOP IF shutdown is required, THEN:

- Decrease the unit load at a rate based on the ability to remove the unit from line in a controlled manner
- Notify Reactor Group Engineer of occurrence.
- IF reactor power is greater than 15%, THEN:
 - Initiate unit shutdown. REFER TO:
 - OPI1IN6100/003 (Controlling Procedure For Unit Operation)

OR

 - API1/AI5500/09 (Rapid Downpower)
 - Ensure adequate shutdown margin is maintained. REFER TO ROD Book, Section 5.11
 - GOTO Step18.

SRO Consult with station management for further actions

Determine long term plant status. RETURN TO procedure in effect

NUREG-1021 12 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod) NI-SA & NI-IOB fail to automatically open on the SI signal.

I K[e Position Applicant's Actions or Behavior
 ALL Recognizes increased RCS Leakage by Pressurizer Pressure and Level decreasing and Containment Conditions (temp, pressure

and/or Radiation levels) increasing

SRO Directs ROIBOP to manually initiate a Reactor Trip and Safety Injection. Evaluate and perform Immediate action's of EPII /A/50001E-O.

ROIBOP Monitor Enclosure 1 (Foldout Page)

ROVerify Reactor Trip:

- All rod bottom lights - LIT (NO)
- All reactor trip and bypass breakers - OPEN (NO)
- I/Ramps - DECREASING (NO)

Determines reactor is not tripped and informs SRO and performs immediate actions of FR-S.I

SRO Transitions to step I RNO

RO Perform the following:

- Manually trip reactor
- IF reactor will not trip, THEN concurrently:
 - Implement EP/I/A/5000/F-0 (Critical Safety Function Status Trees)
 - GO TO EP/1IN5000IFR-S.I (Response To Nuclear Power Generation/ATWS)

SRO Determines transition to EP/1/A/5000IFR-S.1 (Response To Nuclear

NUREG-1021 13 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWIS (NCS leak of 1500 GPM from ejected Rod) NI-9A & NI-IOB fail to automatically open on the SI signal.

~eI Position Applicant's Actions or Behavior

Power Generation/AWIS) is required.

ROVerify Reactor Trip:

- All rod bottom lights - LIT
- All reactor trip and bypass breakers - OPEN
- hR amps - DECREASING

SRO Determines transition to RNO of step 1 is required

RO Perform the following:

- Manually trip the reactor
- IF reactor will not trip, I!;!LN manually insert rods (CRITICAL STEP)

SRO Transitions to Step 2 NER column and continues.

RO Verify Turbine Trip:

- All turbine stop valves - CLOSED

OR

- All turbine control valves - CLOSED

BOP Verify CA pumps are running as follows:

a. Motor driven CA pumps - ON

EXAMINER NOTE: The SRO may determine that the iB CA pump is tagged and determine the RNO is Not Applicable

NURFU-]021 14of32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

[nPosition Applicant's Actions or Behavior

RO b. S/G levels-GREATER THAN 11%
Determines this condition does not exist and informs SRO

SRO Transitions to step 3.b RNO.

BOP Ensure CA Pump #1 - RUNNING

BOPInitiate emergency boration of NC System as follows:

- a. Verify at least one NV pump - ON
- b. Open 1 NV-238B (Boric Acid To NV Pumps Suct)
- c. Ensure both boric acid transfer pump switches - IN THE "ON" POSITION.
- d. Verify emergency boration flow - GREATER THAN OR EQUAL TO 30 GPM
- e. Verify the following charging line isolation valves - OPEN:

- 1NV-321A (Chrg Line Cont Isol)

- 1NV-314B (chrg Line Cont Isol)

Determines that this does not exist and informs SRO.

SRO Transition to step 4.e RNO

NUREG-1021 15 of32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

Time Position Applicant's Actions or Behavior

BOP Perform the following:

1) Align NV pump suction to the FWST as follows:

a) Open the following valves:

- 1NV-252A (NV Pumps Suct From FWST)
- 1NV-253B (NV Pumps Suct From FWST)

b) Close the following valves:

- c) 1 NV-i 88A (VCT OtIt Isol)
- d) 1 NV-i 89B (VCT OtIt Isol)

2) Ensure the following valves - OPEN: : (CRITICAL TASK)

- iNI-9A (NV Pmp CIL Inj Isol)
- iNI-IOB (NV Pmp CIL Inj Isol)

SRO Transitions back to Step 4.f NER column and directs operators.

RO Verify Pzr pressure - LESS THAN 2335 PSIG.

SOP Verify S/I status as follows:

a. "SAFETY INJECTION ACTUATED" status light (ISI-13 - LIT

b. WJILN manpower AND time permits, THEN verify proper system alignments. REFER TO Enclosure 1 (System Verification Following S/I Actuation)

EXAMINER NOTE: Enclosure i affached.

RO Verify the following trips have occurred:
Reactor Trip

Determines reactor not tripped and informs SRO

NUREG-1021 ~6 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

LPI Position Applicant's Actions or Behavior

SRO Transitions to Step 6.a RNO.

RO Dispatch Operator to open the following:

- Reactor trip breakers
- Reactor trip bypass breakers
- The following breakers for CRD MIG sets:
 - "MotoC" Breaker.
 - "Generator" Breaker.

SRO Transitions to Step 6.b NER column and directs operators.

RO Verify Turbine Trip

RO Control SIG levels as follows:

Verify NIR level in at least one SIG - GREATER THAN 11% (29% ACC)

Determines this does not exist and informs SRO.

SRO Transition to step 7 RNO.

RO Perform the following:

- IF total CA flow is less than 1000 GPM, THEN manually start pumps and align valves as required
- WHEN N/R level is greater than 11% (29% ACC) in at least one SIG, THEN perform step 7.b

NUREG-1021 17 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Position Applicant's Actions or Behavior

- GO TO step 7.c

BOP WHEN either of the following annunciators are lit, THEN REFER TO

AP/11AI5500106 (Loss Of SIG Feedwater)

- 1AD-5, H/4 "CACST LO LEVEL"

OR

- 1AD-8, B/i "UST LO LEVEL"

BOP Ensure all dilution paths are isolated as follows:

- Place NC makeup control switch to "STOP"
- Place reactor makeup water pumps to "OFF"

RO Verify main steamlines are intact as follows:

a. Verify the following:

- All SIG pressures - STABLE OR INCREASING
- All SIGs - PRESSURIZED

SRO GO TO step 12.

RO Verify all NC T-Colds - STABLE OR INCREASING.

RO Verify Core Exit TCs - LESS THAN 12000F.

RO Verify the reactor is subcritical as follows:

- PIR channels - LESS THAN 5%

NUREG-1021 18 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWYS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-i OB fail to automatically open on the SI signal.

Time [Position Applicant's Actions or Behavior

L • IIRSUR-NEGATIVE
 NUREG-1021 19 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-IOB fail to automatically open on the SI signal.

[Position Applicant's Actions or Behavior

BOPEnsure adequate shutdown margin as follows:

a.Ensure the following signals - RESET:

- Phase A Containment Isolations
- KC NC NI NM St signals

BOP/SRO b. Obtain current NC boron concentration from Primary Chemistry.

ALLb. WHEN current NC boron concentration is obtained, THEN perform shutdown margin calculation. REFER TO OP/0/N61 00/006 (Reactivity Balance Calculation)

c. WHEN following conditions are satisfied, THEN stop NC System boration:

- Adequate shutdown margin is obtained
- Uncontrolled cooldown has been stopped

SRO mplement RPIOIA/50001001 (Classification Of Emergency).

SRO RETURN TO procedure and step in effect.

SRO Determines transition to EP/I/A/5000IE-0, Step 1 is appropriate.
 Reminds RO/BOP to monitor Enclosure 1 of EP/1IAI5000/E-0.

- RO Verify Reactor Trip:
 - All rod bottom lights - LIT
 - All reactor trip and bypass breakers - OPEN
 - hR amps - DECREASING

NUREG-1021 20of32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-IOB fail to automatically open on the SI signal.

~meI Position Applicant's Actions or Behavior

RO Verify Turbine Trip:

- All turbine stop valves - CLOSED
- OR

BOP Verify 1 ETA and 1 ETB - ENERGIZED
 BOP Verify S/I is actuated:

- "SAFETY INJECTION ACTUATED" status light (1SI-13) - LIT
- EIS load sequencer actuated status lights (1SI-14) - LIT

RO Announce "Unit 1 Safety Injection".

SRO Implement RPIOIA/50001001 (Classification Of Emergency).

RO Verify all Feedwater Isolation status lights (151-5) - LIT.

BOP Verify Phase A Containment Isolation status as follows:

- Phase A "RESET" lights - DARK
- Monitor Light Panel Group 5 St lights - LIT.

BOP Verify proper Phase B actuation as follows:

- Containment pressure - HAS REMAINED LESS THAN 3 PSIG
 Determines that containment pressure has exceeded 3 Si and

NUREG-1021 21 of32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-IOB fail to automatically open on the SI signal.

Fm Position Applicant's Actions or Behavior

informs SRO.

SRO Transition to step 10.a RNO.

BOP Perform the following:

NOTE: This time may be used later to determine when to align ND
 Aux spray

- Record approximate time of reactor trip _____
- Verify NS pumps - INDICATING FLOW.
- IF flow is not indicated,utti manually initiate Phase B Isolation.

Determines step does not apply and continues.

- Verify Phase B Isolation has actuated as follows:
 - Phase B Isolation "RESET" lights - DARK
 - IF Phase B Isolation "RESET" lights are lit, THEN manually initiate Phase B Isolation.
- Verify following monitor light panel lights - LIT:
 - Group 1 Sp lights
 - Group 5 Sp lights
 - GroupS St lights LIII and L112

IF monitor light panel is not in correct alignment, THEN ensure correct valve alignment and component operation.

BOP Stop all NC pumps while maintaining seal injection flow.
 NUREG-1021 22of32 Rev, 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-IOB fail to automatically open on the SI signal.

TimePosition Applicant's Actions or Behavior

SRO GO TO step 11

BOP Verify proper CA pump status as follows:

Motor driven CA pumps - ON

EXAMINER NOTE: The SRO may determine that the I B CA pump is tagged and determine that the RNO is Not Applicable.

RO 3 SIG NIR levels - GREATER THAN 11%

SRO Transitions to step 3.b RNO.

BOP Ensure CA Pump #1 - RUNNING

BOP Verify all of the following S/I pumps - ON:

- Nvpumps
- NDpumps
- NI pumps

BOP Verify all KC pumps - ON

BOP Verify all Unit 1 and Unit 2 RN pumps - ON

NUREG-1021 23 of32 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-IOB fail to automatically open on the SI signal.

II Position Applicant's Actions or Behavior

BOP . Verify proper ventilation systems operation as follows:

- REFER TO Enclosure 2 (Ventilation System Verification)
- Notify Unit 2 operator to perform Enclosure 3 (Opposite Unit Ventilation Verification)

RO Verify all SIG pressures - GREATER THAN 775 PSIG.

BOP/RO Verify proper S/I flow as follows:

- "NV S/I FLOW" - INDICATING FLOW
- NC pressure - LESS THAN 1620 PSIG
- NI pumps - INDICATING FLOW
- NC pressure - LESS THAN 285 PSIG

Determines NC pressure is greater than 285 psig and informs SRO.

SRO Transition to step 17.d RNO.

BOP Perform the following:

Ensure ND pump miniflow valve on operating ND pump(s) - OPEN

SRO GO TO step 18.

NUREG-1021 24 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWIS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

I K[e Position Applicant's Actions or Behavior

BOP Control SIG levels as follows:

- Verify total CA flow - GREATER THAN 450 GPM

WHEN at least one SIG NIR level is greater than 11% (29% ACC),
THEN throttle feed flow to maintain all S/C N/R levels between 11%
(29% ACC) and 50%

- Verify all CA isolation valves - OPEN
- Verify S/I equipment status based on monitor light panel - IN

PROPER ALIGNMENT

SRO NOTE: Enclosure 4 (NC Temperature Control) shall remain in effect
until subsequent procedures provide alternative NC temperature
control guidance.

RO Control NC temperature. REFER TO Enclosure 4 (NC Temperature
Control).

Verify Pzr PORV and Pzr spray valve status as follows:

- BOP
- All Pzr PORVs - CLOSED
 - Normal Pzr spray valves - CLOSED
 - At least one Pzr PORV isolation valve - OPEN

RO Verify NC subcooling based on core exit TICs - GREATER THAN
00F

Determines that subcooling has been lost and informs SRO.

SRO Transitions to step 23 RNO.

NUREG-1021 25 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AW'S (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the St signal.

Time Position Applicant's Actions or Behavior

BOP IF any NV OR NI pump is on, THEN:

- Ensure all NC pumps - OFF
- Maintain seal injection flow

RO Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING

- All SIGs - PRESSURIZED

BOP Verify SIG tubes are intact as follows:

- Verify the following EMF trip 1 lights - DARK
- 1 EMF-33 (Condenser Air Ejector Exhaust)
- 1EMF-34 (SIG Sample)
- 1EMF-26 (Steamline IA)
- 1EMF-27 (Steamline IB)
- 1EMF-28 (Steamline iC)
- 1EMF-29 (Steamline ID)

- All SIG levels - STABLE OR INCREASING IN A CONTROLLED MANNER

BOP Verify NC System is intact as follows:

- Containment pressure - LESS THAN 1 PSIG.
Determines pressure has exceeded 1 psig and informs SRO.

SRO Performs step 26 RNO and transitions to EPI1IN5000IE-1 (Loss of Reactor Or Secondary Coolant.

NUREG-1021 26 of 32 Rev. 5
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWIS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

Time Position Applicant's Actions or Behavior

ALL Monitor Enclosure 1 (Foldout Page).

RO Verify main steamlines are intact as follows:

- All S/G pressures - STABLE OR INCREASING
- All SIGs - PRESSURIZED

BOP Control intact SIG levels as follows:

- Verify N/R level in all intact SIGs - GREATER THAN 11% (29% ACC)

Determines condition does not exist and informs SRO.

SRO Performs Step 3.a RNO.

BOP • Maintain Total Feed Flow > 450 GPM until at least 1 intact SIG
NIR >11% (29%ACC)

- Throttle feed flow to maintain all intact SIG NIR levels between 11% (29% ACC) and 50%

ALL Ensure CA suction source switchover criterion is monitored. REFER TO Enclosure 1 (Foldout Page).

NURFG-1021 27 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

LIZ m~osition Applicant's Actions or Behavior

BOP Verify secondary radiation is normal as follows:

Ensure the following signals - RESET:

- Phase A Containment Isolations
- CA System valve control
- KC NC NI NM St signals

Align all SIGs for Chemistry sampling.

Perform at least one of the following:

- Notify Chemistry to sample all S/Gs for activity
- OR
- Notify Chemistry or RP to frisk all cation columns for activity

Verify the following EMF trip I lights - DARK:

- 1 EMF-33 (Condenser Air Ejector Exhaust)
- 1 EMF-34 (S/G Sample)
- 1EMF-26 (Steamline IA)
- IEMF-27 (Steamline IB)
- 1EMF-28 (Steamline iC)
- IEMF-29 (Steamline iD)

ALL WHEN activity results are reported, THEN verify all S/Gs indicate no activity.

NUREG-1021 28 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWIS (NCS leak of 1500 GPM from ejected Rod)
NI-gA & NI-i OB fail to automatically open on the SI signal.

II Position Applicant's Actions or Behavior
BOP Verify Pzr PORV and isolation valve status as follows:
• Power to all Pzr PORV isolation valves - AVAILABLE
• All Pzr PORVs - CLOSED
• At least one Pzr PORV isolation valve - OPEN

ALL IF AT ANY TIME a Pzr PORV opens due to high pressure, THEN, after Pzr pressure decreases to less than 2315 PSIG, ensure the valve closes or is isolated.

RO/BOP Verify S/I termination criteria as follows:

NC subcooling based on core exit TICs - GREATER THAN 00F

Verify secondary heat sink as follows:

- NIR level in at least one intact SIG - GREATER THAN 11% (29% ACC)

OR

- Total feed flow to all intact SIGs - GREATER THAN 450 GPM

NC pressure - STABLE OR INCREASING

Pzr level - GREATER THAN 11% (20% ACC) (NO)

SRO Transitions to step 6.d RNO.

NUREG-1021 29 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with AWIS (NCS leak of 1500 GPM from ejected Rod)
NI-9A & NI-IOB fail to automatically open on the SI signal.

[¶] Position Applicant's Actions or Behavior

BOP IE NC pressure is increasing AND normal Pzr spray is available, THEN attempt to stabilize NC pressure using normal Pzr spray

EXAMINER NOTE: Normal spray is not available due to NC pumps being secured.

SRO GO TO step 6.f.

ALL Monitor S/I termination criteria. REFER TO Enclosure 2 (SII Termination Criteria)

IF AT ANY TIME S/I termination criteria is met while in this procedure, THEN RETURN TO step 6.

Verify proper NS pump operation as follows:

BOP At least one NS pump - ON

Verify the following valves - OPEN:

- 1FW-27A (ND Pump IA Suct From FWST)
- 1 FW-55B (ND Pump 1 B Suct From FWST)

Containment pressure - LESS THAN 2.4 PSIG

Ensure S/I - RESET:

- ECCS

- DIG load sequencers

NUREG-1021 30 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-10B fail to automatically open on the SI signal.

Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

ALL		IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on.
-----	--	------------------------------------------------------------------------

BOP		Reset NS
-----	--	----------

Stop NS pumps

Close the following valves:

- 1NS-29A(NS Spray Hdr IA Cont Iso)
- 1NS-32A (NS Spray Hdr IA Cont Iso)
- INS-15B (NS Spray Hdr IB Cont Iso)
- INS-12B (NS Spray Hdr IB Cont Isol)

BOP		Verify criteria to stop operating ND pumps as follows:
-----	--	--------------------------------------------------------

- NC pressure - GREATER THAN 285 PSIG
- NC pressure - STABLE OR INCREASING
- At least one ND pump - ON
- Ensure S/I - RESET:
 - ECCS
 - D/G load sequencers

ALL		IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on.
-----	--	------------------------------------------------------------------------

BOP		Ensure all ND pump(s) not supporting Cold Leg Recirc - STOPPED.
-----	--	-----------------------------------------------------------------

NUREG-1021 31 of 32 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: S Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
 NI-9A & NI-10B fail to automatically open on the SI signal.

Time	Position	Applicant's Actions or Behavior
------	----------	---------------------------------

ALL		IF AT ANY TIME NC pressure decreases to less than 285 PSIG in an uncontrolled manner, THEN restart ND pumps.
-----	--	--------------------------------------------------------------------------------------------------------------

RO Verify LOCA has occurred as follows:

- All SIG pressures -STABLE or increasing
- NC pressure - STABLE OR DECREASING

BOP Verify conditions to stop operating D/Gs as follows:

At least one DIG - ON

Verify 1 ETA is energized by offsite power as follows:

- DIG iABKRTO ETA-OPEN
- 1 ETA undervoltage status lights (1SI-14) - DARK

WHEN S/I is reset, EtjLN dispatch operator to stop IA DIG and place in standby readiness. REFER TO OP/i 1N63501002 (Diesel DIG Generator Operation)

Verify 1 ETB is energized by offsite power as follows:

- DIGiBBKRTOETr-OPEN
 - iETB undervoltage status lights (1SI-14)-DARK
- WHEN S/I is reset, THEN dispatch operator to stop IB DIG and place in standby readiness. REFER TO OPI1/N6350/002 (Diesel Generator Operation)

Ensure S/I RESET:

- ECCS
- DIG load sequences

NUREG-1021 32 of 32 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 3 Event No.: 6

Event Description: Rod Ejection with ATWS (NCS leak of 1500 GPM from ejected Rod)
NI 9A & NI-IOB fail to automatically open on the SI signal.
Lpime LfflJ~osition Applicant's Actions or Behavior

ALL IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on.

SOP Obtain containment H2 concentration as follows:

- Ensure operator has been dispatched to secure all ice condenser air handling units. REFER TO Enclosure 3 (Securing All Ice Condenser Air Handling Units).
- Verify containment H2 analyzers- IN SERVICE
- Verify containment H2 concentration- LESS THAN 6%.
- Verify containment H2 concentration-LESS THAN 0.5%.
- When ice condenser air handling units are off AND h2 concentration is less than 6%, THEN energize the H2 igniters (1 MC-7)

ALL EXAMINER NOTE: At this time, the normal breakers for I ETA will open and IA Diesel Generator will load blackout loads on the bus. Per procedure, the crew must load LOCA loads on the bus. (IA NI will be the only equipment required to be started).

ALL EXAMINER NOTE The scenario can be terminated when the

required SI loads are on the bus

TERMINATE SCENARIO WHEN REQUIRED PUMP(S) STARTED. (NI)

Classification: RP/O/A/5000/001 (Classification Of Emergency) Enclosure 4.1 - Site Area Emergency (Based on Reactor failing to Trip from a valid Reactor Trip signal received or required and automatic reactor trip was not successful, and Manual reactor trip from the control room was not successful in reducing reactor power to less than 50% and decreasing

(4A.S.1-1)

NUREG-1021

33 of 32

Rev. 8

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 1

Event Description: Boration for load decrease

[Time ~oswon] Applicant's Actions or Behavior

BOP Refer to OP/11N6150/009 (Boron Concentration Control), Enclosure 4.2 (Boration)

Ensure the following valve control switches in "AUTO":

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl)
- 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)

Adjust the boric acid batch counter to the desired volume of boric acid to be added.

Place the "NC MAKEUP MODE SELECT" switch in "BORATE".

Adjust the controller for 1 NV-238A (B/A Xfer Pmp to Blender Ctrl) to the desired flow.

Ensure 1 NV-238A (B/A Xfer Pmp to Blender Ctrl) controller in "AUTO".

Ensure at least one boric acid transfer pump in "AUTO" or "ON".

NOTE: If necessary, boration can be manually secured at any time by placing the "NC MAKEUP CONTROL" switch to the "STOP" position.

Place the "NC MAKEUP MODE SELECT" switch to the "START" position.

Verify the following valves open:

- 1 NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv)
- 1 NV-I 86A (B/A Blender Ott To VCT OtIt)

IF in "AUTO", verify the boric acid transfer pump starts.

Verify proper flow by observing the boric acid flow totalizer {PIP 96-

0137)

NUREG-1021

1 of 2

Rev. 8

Appendix D

Operator Actions

Form ES-D-2

{ Op- Test No.: NRC Scenario No.: 4 Event No.: 1

Event

Description: Boration for load decrease

Efftime ffl~osition Applicant's Actions or Behavior

BOP WHEN the desired volume of boric acid is reached on the boric acid

batch counter, ensure the following valves close:

.1 NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv)

•1NV-186A (B/A Blender Ott To VCT OtIt)

IF desired, flush the makeup line as follows:

- Open the following valves:
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - 1NV-186A (B/A Blender OtIt To VCT OtIt)

- WHEN -20 gallons of makeup water have been flushed through the makeup line, close the following valves:
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - 1 NV-i 86A (B/A Blender OtIt To VCT OtIt)

- Place the following valve control switches in "AUTO":
 - 1 NV-242A (RMWST To B/A Blender Ctrl)
 - 1NV-186A (B/A Blender OtIt To VCT OtIt)

IF automatic makeup is desired, refer to Enclosure 4.1 (Automatic Makeup).

NUREG-1021 2 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 2

Event Description: Decrease turbine load

Position Applicant's Actions or Behavior

RO Refer to OPI1/B/6300/OO1 (Turbine Generator), Enclosure 4.2 (Load Changing), Step 2.4

Depress the "Load Rate" pushbutton and verify it illuminates.

Input the desired load rate on the numeric keypad and verify the load rate appears on the Variable Display.

Depress the "Enter" pushbutton.

Depress the "Targer' pushbutton and verify it illuminates.

Input the desired load target on the numeric keypad and verify the load target appears on the Target Display.

Depress the "Enter" pushbutton.

To start load decrease, depress the "Go" pushbutton and verify it illuminates.

S/G blowdown changes should be coordinated with Secondary Chemistry.

NUREG-102~ 3 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 3

Event Description: Trip of running KC Pump

mTime Position Applicant's Actions or Behavior
BOP Recognizes and reports Trip of operating KC Pump.

SRO Implements and directs actions of AP111N5500121 (Loss of Component Cooling)

CAUTION: Failure to restore NC pump seal cooling via thermal barrier cooling or NV seal injection within 10 minutes will cause damage to the NC pump seals resulting in NC inventory loss.

Monitor Enclosure 1 (Foldout Page).

NOTE: The following step prevents damage to the 1 B2 KC pump as a result of deadheading. (PIP #00-5862)

BOP IF AT ANY TIME the following conditions are met:

- Train B KC isolation valves - CLOSED

AND

- 1 KC-81 B (KC to ND HX IB Sup Isol) - CLOSED.

THEN

- a. Ensure less than 2 train B KC Pumps - IN SERVICE.

Verify at least one KC pump - ON

Determines no KC pumps are running and informs SRO.

Transitions to Step 3 RNO and directs the operators.

NUREG-~O21 4 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 3

Event Description: Trip of running KC Pump

ffflme~::~'tion[Applicant's Actions or Behavior

SRO CAUTION: Operation of more than one train B KC pump should be avoided when the train B KC isolation valves and 1 KC-81 B (KC To ND HX 1 B Sup Isol) are closed.

BOP Perform the following:

- a. Start at least one KC pump

Determines that pump alternate KC pump started and informs SRO.

SRO SRO determines that Step 3.b RNO does not apply and transitions to Step 4 A/ER column and directs operators.

SRO CAUTION: A loss of KC cooling to the NC pumps results in a gradual approach to an over heated condition in approximately 10 minutes which will result in shaft seizure.

BOP Verify KC flow to NC pumps as follows:

- 1AD-20 Ni "KC SUPPLY HDR FLOW TO NCP BRGS LOW" - DARK
- 1AD-21 Ni "KC SUPPLY HDR FLOW TO NCP BRGS LOW" - DARK

BOP Verify KC available as follows:

Verify the following Train A KC isolation valves - OPEN:

- 1 KC-230A (Rx Bldg Non-Ess Hdr Isol)
- 1KC-3A (Rx Bldg Non-Ess Ret Hdr Isol)
- 1 KC-SOA (Aux Bldg Non-Ess Hdr Isol)
- 1KC-1A (Aux Bldg Non-Ess Ret Hdr iso)

NUREG-1021 5 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 3

Event Description: Trip of running KC Pump

[Timeflition! Applicant's Actions or Behavior

BOP Verify the following Train B KC isolation valves - OPEN:

- 1 KC-228B (Rx Bldg Non-Ess Hdr Isol)
- 1KC-18B (Rx Bldg Non-Ess Ret Hdr Isol)
- 1KC-53B (Aux Bldg Non-Ess Hdr 1501)
- IKC-2B (Aux Bldg Non-Ess Ret Hdr Isol)

SRO CAUTION: Operation of more than one train B KC pump should be avoided when the train B KC isolation valves and 1 KC-81 B (KC To ND Hx IB Sup Isol) are closed

BOP Start additional KC pump(s) as necessary to supply any KC loads presently in service.

BOP Verify KC surge tank levels normal as follows:

- a. Verify both KC surge tank levels - 50% - 90% AND STABLE.
- b. GOLOStePIO.

BOP Ensure KC heat exchanger outlet mode switches - PROPERLY ALIGNED.

SRO Determine and correct cause of loss of KC.

NUREG-1021 6 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No NRC Scenario No.: 4 Event No.: 3

Event Description: Trip of running KC Pump

[11imeITh[oswon Applicant's Actions or Behavior

SRO Ensure compliance with appropriate Tech Specs and Selected Licensee Commitments Manual:

- SLC 16.9-7 (Boration Systems Flow Path - Shutdown)
- SLC 16.9-8 (Boration Systems Flow Path - Operating)
- SLC 16.9-9 (Boration Systems Charging Pump - Shutdown)
- SLC 16.9-10 (Boration Systems Charging Pumps-Operating)
- 3.5.2 (ECCS - Operating)
- 3.5.3 (ECCS - Shutdown)
- 3.6.6 (Containment Spray System)

- 3.7.5 (Auxiliary Feedwater (AFW) System)
- 3.7.7 (Component Cooling Water (CCW) System)

(NO)

Determine required notification:

- REFER TO RP/01N50001001 (Classification Of Emergency)
- REFER TO RPIOINS000/013 (NRC Notification Requirements)

IF KC Hx leak to RN is suspected, THEN perform the following:

Determines that this step is not applicable and continues to Step 15.
Verify KC surge tanks level as follows:

- Greater than 50%

NUREG-1021 7 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No NRC Scenario No.: 4 Event No.: 3

Event Description: Trip of running KC Pump
Time Position Applicant's Actions or Behavior

RO Verify IAD-7, F13 "LETDN HX OUTLET HI TEMP" - DARK

BOP IF desired to restore letdown flow through the NV demineralizers,
THEN momentarily place 1 NV-i 53A (Ltdn Hx Ott 3-Way Vlv) to the
"DEM IN" position and return to "AUTO"

SRO Determine long term plant status.
RETURN TO procedure in affect

NUREG-1021 8 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 4

Event Description: Pressurizer Pressure Channel I Fails High
Time Position Applicant's Actions or Behavior

LZ Determines that Pressurizer Pressure Channel I has failed high,
informs SRO, and performs immediate action steps from memory.

Implements AP/1/AI5500/1 1 (Pressurizer Pressure Anomalies), Case

I (Pressurizer Pressure Decreasing) and directs operators.

BOP Verify all Pzr level channels - INDICATING THE SAME

Determines that Channel 1 is reading high and informs SRO.

IF either selected channel is failed high, THEN place "PZR PRESS CTRL SELECT" switch in any alternate operable channel position.

RO Verify all Pzr PORVS - CLOSED.

Verify all Pzr heaters - ENERGIZED.

Ensure 1 NV-37A (NV Supply To Pzr Aux Spray) - CLOSED.

Verify NC pressure - STABLE OR INCREASING.

IF a Pzr pressure channel is failed high, THEN notify IAE to fail the following bistables for the affected channel under Model WIO #91002943. Bistables shall be tripped within six (6) hours:

- Pzr low pressure S/I
- OT Delta T
- Pzr high pressure Reactor Trip
- Pzr low pressure Reactor Trip

NUREG-1021 9 of 2 Rev. 8
 Appendix D Operator Actions Form ES-D-2

Op-Test No.: NRC Scenario No.: 4 Event No.: 4

Event Description: Pressurizer Pressure Channel I Fails High

Time	Position	Applicant's Actions or Behavior
		BOPEnsure compliance with appropriate Tech Specs:
		• 3.3.1 (Reactor Trip System Instrumentation)
		• 3.3.2 (Engineered Safety Features Actuation System)
		• 3.3.3 (Post Accident Monitoring Instrumentation)
		• 3.3.4 (Remote Shutdown System)
		• 3.4.1 (RCS Pressure, Temperature, and Flow Departure From Nucleate Boiling Limits)
		• 3.4.4 (RCS Loops - MODES 1 and 2)
		• 3.4.5 (RCS Loops - MODE 3)
		• 3.4.6 (RCS Loops - MODE 4)
		• 3.4.9 (Pressurizer)
		• 3.4.10 (Pressurizer Safety Valves)
		• 3.4.11 (Pressurizer Power Operated Relief Valves)
		SRO Ensure "PZR PRESS REC SELECT" is selected to an operable channel.
		BOP Determine long term plant status. RETURN TO procedure in effect.

- 3.3.1 (Reactor Trip System Instrumentation)
- 3.3.2 (Engineered Safety Features Actuation System)
- 3.3.3 (Post Accident Monitoring Instrumentation)
- 3.3.4 (Remote Shutdown System)
- 3.4.1 (RCS Pressure, Temperature, and Flow Departure From Nucleate Boiling Limits)
- 3.4.4 (RCS Loops - MODES 1 and 2)
- 3.4.5 (RCS Loops - MODE 3)
- 3.4.6 (RCS Loops - MODE 4)
- 3.4.9 (Pressurizer)
- 3.4.10 (Pressurizer Safety Valves)
- 3.4.11 (Pressurizer Power Operated Relief Valves)

NUREG-1021 10 of 2 Rev. 8
 Appendix D Operator Actions Form ES-D-2
 Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

RO Determines Main Steam Isolation Valve has closed and informs SRO.

SRO Directs RO to trip the reactor.

RO Trips Reactor.

ROIBOP Perform Immediate actions of E-O from memory

EXAMINER NOTE: Turbine will fail to trip automatically on reactor trip and RO will have to manually trip the turbine. Additionally, automatic S/I will not occur and the BOP will have

C _____
to manually initiate both trains of safety injection.

SRO Enter EPI1IAI5000/E-O (Reactor Trip or Safety Injection) and direct actions of operators.

EXAMINER NOTE: A large break LOCA occurs coincident with the reactor trip.

ROIBOP Monitor Enclosure 1 (Foldout Page)

ROVerify Reactor Trip:

- All rod bottom lights - LIT
- All reactor trip and bypass breakers - OPEN
- I/Ramps - DECREASING

Verify Turbine Trip:

- All turbine stop valves - CLOSED
OR
- All turbine control valves - CLOSED

EXAMINER NOTE: RO will manually trip the turbine per Step 3.a RNO if not previously tripped.

NUREG-1021 1 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time	Position	Applicant's Actions or Behavior
BOP	Verify IETA and 1ETB - ENERGIZED	

Verify S/I is actuated:

- a. "SAFETY INJECTION ACTUATED" status light (1SI-13 - LIT

EXAMINER NOTE: BOP will initiate SII here per Step 5 RNO if not previously completed.

- b. E/S load sequence actuated status lights (1SI-14) - LIT

RO Announce "Unit 1 Safety Injection"

SRO Implement RPIOIA/5000/OO1 (Classification Of Emergency)

RO Verify all Feedwater Isolation status lights (151-5) - LIT

BOPVerify Phase A Containment Isolation status as follows:

- a. Phase A "RESET" lights - DARK
- b. Monitor Light Panel Group 5 St lights - LIT

BOP Verify proper Phase B actuation as follows:

- a. Containment pressure - HAS REMAINED LESS THAN 3 PSIG
Determines that pressure has not remained less than 3 psig and informs SRO.

Transitions to Step 10.a RNO and directs operators.

EXAMINER NOTE: Greater than 3 psig in containment requires use of ACC numbers throughout the remainder of the scenario. ACC numbers are designated in parentheses behind normal

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior
SRO Perform the following:

NOTE: This time may be used later to determine when to align ND
Aux spray

- 1) Record approximate time of reactor trip
- 2) Verify NS pumps - INDICATING FLOW.
- 3) IE flow is not indicated, THEN manually initiate Phase B Isolation.

Determines that this step 3) is not required based on plant conditions

4) Verify Phase B Isoaltion has actuated as follows:

- a) Phase B Isolation "RESET" lights - DARK.
- b) if Phase B Isolation "RESET" lights are lit, THEN manually initiate Phase B:

Determines that this step b) is not required based on plant conditions

- c) Verify following monitor light panel lights - LIT:
 - Group I Sp lights
 - Group 5 Sp lights
 - GroupS Sp lights Lu 1 and L112
- d) JEmonitor light panel is not in correct alignment, THEN ensure correct valve alignment and component operation.

5) Stop all NC pumps while maintains seal injection flow.

6) GOIQStepll.

RO Verify proper CA pump status as follows:

a. Motor driven CA pumps - ON

Determines that 1 B CA Pump is not running due to being tagged out.

Event Description: Main Steam Isolation Valve Closes at Power

TimePosition Applicant's Actions or Behavior
SROTransition to step 11.8 RNO and directs operators.

BOP a. Perform the fol~owing for affected train(s):

- 1) Reset ECCS.
- 2) Reset DIG load sequencer.
- 3) Manually start affected motor drive CA pump.
- 4) IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on.

ROIBOP Transitions toNER column Step 11 .b and directs operators.

RO b. 3 SIG NIR levels - GREATER THAN 11%

BOP Verify all of the following S/I pumps - ON:

- Nvpumps
- ND pumps
- NI pumps

Verify all KC pumps - ON

Determines that 1 Bi KC pump is off and informs SRO.

SRO Transition to step 13 RNO.

Perform the following for affected train(s):

- a. Reset ECCS.
- b. Reset DIG load sequencer.
- c. Manually start affected pump.

d. IF AT ANY TIME a BIO occurs, THEN restart S/I e ui ment

NUREG-102~ 4of2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior
previously on.

Transitions back to Step 14 AIER column and directs operators.

BOP Verify all Unit 1 and Unit 2 RN pumps - ON

Verify proper ventilation systems operation as follows:

- REFER TO Enclosure 2 (Ventilation System Verification)
- Notify Unit 2 operator to perform Enclosure 3 (Opposite Unit Ventilation Verification).

RO Verify all S/G pressures - GREATER THAN 775 PSIG

RO EXAMINER NOTE: SRO will transition to Step i6 RNO if SIG pressures are less than 775 psig and perform the RNO. This step may or may not occur depending on timing of the scenario.

Perform the following:

- a. Verify the following valves - CLOSED:
 - AIIMSIVs
 - All MSIV bypass valves
 - All SIG PORVs

b. IF any valve is still open THEN manually close valve.
Transition back to Step 17 AIER column and direct operators.

Verify proper S/I flow as follows:

a. "NV S/I FLOW" - INDICATION FLOW

b. NC pressure - LESS THAN 1620 PSIG

C. NI pumps - INDICATING FLOW

d. NC pressure - LESS THAN 285 PSIG

NURFG-1021 5 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

e. ND pumps - INDICATING FLOW TO C-LEGS

BOP Control S/G levels as follows:

a. Verify total CA flow - GREATER THAN 450 GPM

b. WHEN at least one S/G NIR level is greater than 11% (20% ACC), THEN throttle feed flow to maintain all SIG NIR levels between 11% (29% ACC) and 50%

RO Verify all CA isolation valves - OPEN

BOP Verify S/I equipment status based on monitor light panel - IN

PROPER ALIGNMENT

SRO NOTE: Enclosure 4 (NC Temperature Control) shall remain in effect until subsequent procedures provide alternative NC temperature control guidance

RO Control NC temperature REFER TO Enclosure 4 (NC Temperature Control)

Verify Pzr PORV and Pzr spray valve status as follows:

a. All Pzr PORVs - CLOSED

b. Normal Pzr spray valves - CLOSED

c. At least one Pzr PORV isolation valve- OPEN

Verify NC subcooling based on core exit TICs - GREATER THAN 00F

Determines that subcooling is less than 00F and notifies SRO.

SRO Transition to step 23 RNO.

NUREO-1021 6 of 2 Rev. 8
Appendix 0 Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

RO LE any NV OR NI pump is on, THEN:

a. Ensure all NC pumps - OFF

b. Maintain seal injection flow.

Transition to Step 25 NER column and directs operators.

RO Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING

- All SIGs - PRESSURIZED

Verify S/G tubes are intact as follows:

- Verify the following EMF trip 1 lights - DARK:
 - 1 EMF-33 (Condenser Air Ejector Exhaust)
 - 1 EMF-34 (SIG Sample)
 - 1EMF-26 (Steamline IA)
 - 1EMF-27 (Steamline IB)
 - 1EMF-28 (Steamline iC)
 - 1EMF-29 (Steamline iD)
- All SIG levels - STABLE OR INCREASING IN A CONTROLLED MANNER.

Verify NC System is intact as follows:

- Containment pressure - LESS THAN 1 PSIG
Determines that containment pressure is greater than 1 psig and informs SRO.

Transitions to Step 26 RNO.

NUREG-1021 7 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

TimePosition Applicant's Actions or Behavior
SRO Concurrently:

- Implement EPI1IA/5000/F-O (Critical Safety Function Status Trees).
- GO TO ER/i IA/5000/E-1 (Loss Of Reactor Or Secondary Coolant).

EXAMINER NOTE: When FWST Level reaches 37%, ECCS pumps will swap suction to containment sump. ND pump IA trip will occur at 45% FWST Level.

SRO Transition to EP/1/A/5000/FR-P.1 (Response to Imminent PTS Condition) due to valid RED PATH and direct actions.

RO Verify NC pressure - GREATER THAN 285 PSIG.
Determines that pressure is less than 285 psig and notifies SRO.

Transitions to Step 1 RNO and directs operators.

IF ND flow to C;Legs is greater than 675 GPM, THEN RETURN TO procedure and step in effect.

Transitions back to Step 1 of E-1 (Loss of Reactor or Secondary Coolant).

RO/BOP Monitor Enclosure 1 (Foldout Page)

RO Verify main steamlines are intact as follows:

- All SIG pressures - STABLE OR INCREASING
- All SIGs - PRESSURIZED

NUREG-1021 8 of 2 Rev. 8
Appendix 0 Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

Control intact S/G levels as follows:

- Verify N/R level in all intact S/Gs - GREATER THAN 11% (29% ACC)
- Throttle feed flow to maintain all intact SIG NIR levels between 11% (29% ACC) and 50%
- Ensure CA suction source switchover criterion is monitored. REFER TO Enclosure 1 (Foldout Page)

Verify secondary radiation is normal as follows:

a. Ensure the following signals - RESET:

- 1) Phase A Containment Isolations
- 2) CA System valve control
- 3) KC NC NI NM St signals

b. Align all SIGs for Chemistry sampling

c. Perform at least one of the following:

- Notify Chemistry to sample all SIGs for activity
- OR
- Notify Chemistry or RR to frisk all cation columns for activity

d. Verify the following EMF trip 1 lights - DARK

- 1 EMF-33 (Condenser Air Ejector Exhaust)
- 1 EMF-34 (S/G Sample)
- 1 EMF-26 (Steamline IA)
- 1 EMF-27 (Steamline 1 B)
- 1 EMF-28 (Steamline iC)
- 1 EMF-29 (Steamline iD)

e. WHEN activity results are reported, THEN verify all SIGs indicate no activity.

NUREG-1 021 9 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.: 7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

EXAMINER NOTE: When FWST level reaches 37%, go to page Xx of this guide. When swap to cold leg recirculation is complete, then return to the step that was transitioned from.

ROVerify Pzr PORV and isolation valve status as follows:

- a. Power to all Pzr PORV isolation valves - AVAILABLE
 - b. All Pzr PORVs - CLOSED
 - c. At least one Pzr PORV isolation valve - OPEN
- d. IF AT ANY TIME a Pzr PORV opens due to high pressure, THEN after Pzr pressure decreases to less than 2315 PSIG, ensure the valve closes or is isolated.

Verify S/I termination criteria as follows:

- a. NC subcooling based on core exit TICs - GREATER THAN 00F. Determines that S/I termination criteria is not met and informs SRO.

Transition to Step 6.a RNO and then GO TO Step 6.f

Transition to Step 6.f of A/ER column and directs operators.

RO e. Monitor S/I termination criteria. REFER TO Enclosure 2 (S/I Termination Criteria).

f. IF AT ANY TIME S/I termination criteria is met while in this procedure, THEN RETURN TO Step 6.

NUREG-1021 10 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

BOP Verify proper NS pump operation as follows:

- a. At least one NS pump - ON
- b. Verify the following valves - OPEN:
 - 1 FW-27A (ND Pump IA Suct From FWST)
 - 1FW-5SB (ND Pump IB Suct From FWST)

c. Containment pressure - LESS THAN 2.4 PSIG.

d. Ensure S/I - RESET:

1) ECCS

2) D/G load sequencers

3) IF AT ANY TIME a BIO occurs, THEN restart S/I equipment previously on.

e. Reset NS.

f. Stop NS pumps.

g. Close the following valves:

- 1NS-29A (NS Spray Hdr IA Cont Isol)
- 1NS-32A (NS Spray Hdr IA Cont Isol)
- 1NS-15B (NS Spray Hdr IB Cont Isol)
- 1NS-12B (NS Spray Hdr IB Cont Isol)

BOP Verify criteria to stop operating ND pumps as follows:

a. NC pressure - GREATER THAN 285 PSIG (NO)
Determines that pressure is less than 285 psig and informs SRO.

SRO Transition to Step 8.a RNO and then GO TO Step 10.

NUREG-1021 11 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

Time Position Applicant's Actions or Behavior

EXAMINER NOTE: The following steps are in EPIIIM5000IES-1.3 (Transfer to Cold Leg Recirculation). Transition to this point

will occur when FWST level reaches 37%. Also, at this point, ND Pump IA has previously tripped.

ROIBOP Monitor Enclosure 1 (Foldout Page).

SRO CAUTION: S/I recirculation flow to NC System must be maintained at all times.

Performs Steps 3 through 8 without delay. CSFs should not be implemented prior to completion of these steps.

Verify containment sump level - GREATER THAN 3.5 FT.

Verify KC flow to ND heat exchangers - GREATER THAN 5000 GPM.

Ensure S/I - RESET:

- a. ECCS
- b. DIG load sequencers
- c. IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on.

Align S/I system for recirc as follows:

- a. Verify following valves - OPEN:
 - 1NI-185A (ND Pump IA Cont Sump Suct)
 - 1NI-184B (ND Pump IB Cont Sump Suct)
- b. Verify following valves- CLOSED:

NUREG-1021 12 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power

- | Time | Position | Applicant's Actions or Behavior |
|------|----------|-------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none">• 1FW-27A (ND Pump IA Suct From FWST)• 1FW-55B (ND Pump IB Suct From FWST) |

C. Verify ND pumps - ON.

Determines that IAND pump is not on and informs SRO.

Transitions to Step 6.c RNO and directs operators.

Perform the following:

- 1) Start ND pump(s) with suction aligned to an open containment sump suction valve.
- 2) 'Eno ND pump can be started OR no ND train can be aligned for recirc, THEN:

Determines than this step does not apply and transitions to Step 6.d NER column and directs operators.

d. Isolate NI pump miniflow as follows:

- 1) Verify NC pressure - LESS THAN 1620 PSIG.
- 2) Close the following valves:
 - INI-115A (NI Pump IA Miniflow Isol)
 - INI-144A (NI Pump IB Miniflow Isol)

3) Place "PWR DISCON FOR INI-147B" switch in "ENABLE"

4) Close iNI-147B (NI Miniflow Hdr To FWST Isol)

e. Close the following valves:

- 1ND-32A (ND Train IA Hot Leg Inj Isol)
- 1ND-65B (ND Train IB Hot Leg Inj 1501)

f. Verify at least one of the following NV pumps minmow valves CLOSED:

- 1 NV-203A (NV Pumps A&B Recirc Isol)

NUREG-1021 13 of 2 Rev. 8
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power
Time Position Applicant's Actions or Behavior

OR

- 1NV-202B (NV Pumps A&B Recirc Isol)

9. Align ND train discharges to NI and NV pump suction as follows:

1) Open the following valves:

- 1NI-332A (NI Pump Suct X-Over From ND)
- 1NI-333B (NI Rump Suct From ND)

2) Ensure 1 NI-334B (NI Pump Suct X-Over From ND) - OPEN.

3) Open the following valves:

- 1 ND-28A (ND Supply To NV & IA NI Pmps)
- 1NI-136B (ND Supply To NI Pump IB)

h. Isolate FWST from NV and NI pumps as follows:

1) Place "PWR DISCON FOR iNI-IOOB" switch in "ENABLE"

2) Close iNI-IOOB (NI Pmps Suct From FWST)

3) Close the following valves:

- 1NV-252A (NV Pumps Suct From FWST)
- 1NV-253B (NV Pumps Suct From FWST)

i. Verify proper Recirc Flow as follows:

- "NV S/I FLOW" - INDICATING FLOW
- NI pumps - INDICATING FLOW
- ND pumps - INDICATING FLOW

NUREG-1021 14 of 2 Rev. S
Appendix D Operator Actions Form ES-D-2
Op-Test No.: NRC Scenario No.: 4 Event No.:7-10

Event Description: Main Steam Isolation Valve Closes at Power
Time Position Applicant's Actions or Behavior

WHEN FWST level decreases to 11% (1AD-9, E/8 UFWST LO-LO BOPLEVEL" alarm lit), THEN perform the following:

- a. Stop NS Pumps

- b. Align NS for recirc. REFER TO Enclosure 2 (Alignment MS for Recirculation).

Verify proper recirc flow as follows:

- "NV S/I FLOW" - INDICATING FLOW

- NI pumps - INDICATING FLOW

- ND pumps - INDICATING FLOW

SRO EP/1~A/5000/F-O (Critical Safety Function Status Trees) may now be implemented)

TERMINATE SCENARIO WHEN RECIRC FLOW IS VERIFIED