The SFM directs the BOP to swap Condensate Pump Sets to evaluate Condenser air inleakage (Event 1). The BOP starts Condensate Booster Pp Set 1-3 per OP C-7A:I and shuts down Condensate Booster Pp Set 1-1.

The crew is directed to ramp to 50% power (Event 2). The RO will have to dilute to ramp turbine and reactor power to 50%.

Loop 1 Wide Range T-hot fails high (Event 3). Alarm PK05-07, Subcooling Margin Lo/Lo-lo, comes in. The failed instrument, TE-413A, is identified and cut out behind VB-2.

Nuclear instrument channel N-43 fails high (Event 4), causing rods to insert in automatic. The RO should take rod control to manual after verifying rod insertion is not required. The SFM should enter OP AP-5 and direct the BOP to take N-43 out of service. The RO should match T-avg and T-ref before placing rod control back in automatic.

Main feedwater reg valve FCV-510 fails closed (Event 5). The RO should identify the failure and the SFM should direct the BOP to open the Bypass valve to restore feedwater flow to S/G 1-1. The SFM may direct the RO to reduce load to reduce steam flow. The Bypass valve will not open fully and level is lost in S/G 1-1 resulting in a reactor trip.

Three control rods stick partially out on reactor trip (Event 6). The RO recognizes and reports the stuck rods during immediate actions of EOP E-0. At step 3 of EOP E-0.1, the SFM directs Emergency Boration per OP AP-6.

(Event 7) Following the reactor trip, the SFM has transitioned to EOP E-0.1, when a 1000 gpm LOCA develops over 10 minutes. The crew should diagnose the LOCA and the SFM should direct a manual Safety Injection. The SI causes the small LOCA to increase in size to a large LOCA.

Safety Injection Pump 1-1 fails to start in auto (Event 8). The RO recognizes and reports the failure of SIP 1-1 and the SFM directs the manual start of the pump.

The scenario should be terminated after the crew tailboards the transition to EOP E-1.

Facility: DCPP Units 1 & 2 Scenario No.: 5 Op-Test No.: 2

Examiners: Operators:

Objectives: Evaluate the crew's ability to diagnose and respond to a Wide Range T-hot failing high.

Evaluate the crew's ability to diagnose and respond to a Nuclear Instrument channel failing high.

Evaluate the crew's ability to diagnose and respond to a Main FW Reg valve failing closed.

Evaluate the crew in using EOPs during a Small LOCA ramping to a Large LOCA.

Evaluate the crew's ability to diagnose and respond to three control rods partially stuck out.

Evaluate the crew's ability to diagnose and respond to Contmt Spray Pp 1-1 not starting.

Initial Conditions: 30% power, equilibrium xenon, Middle of cycle (IC-33)

Turnover: Main FW Pp 1-2 OOS and expected back next shift.

Directed to swap Condensate Pp Sets.

Directed to increase power to 50%.

Time min	Event No.	Malf. No.	Event Type*	Event Description
var	1		N, BOP	Starts Condensate Pp Set 1-3 and shuts down Condensate Pp Set 1-1
var	2		N/R, CO, SFM	Commence power increase through dilution.
2	3	xmt rcs35	I, BOP, SFM	Loop 1 Wide range T-hot, TE-413A, fails high.
12	4	mal nis6c	I, All	Nuclear Instrument channel N-43 fails high.
22	5	cnv mfw3	C, All	Failure of power to SV-510B causes Feedwater Reg valve FCV-510 to fail closed.

cond on trip	6	mal rod12a mal rod12b mal rod12c	C/R, CO, SFM	Three control rods stick partially out on reactor trip.
cond on trip	7	mal rcs3c mal rcs2	M, All	Loop 3 Small break LOCA ramping to a Large break LOCA.
cond on SI	8	pmp sis1	C, RO	Safety Injection Pump 1-1 fails to start.

* (N)ormal (R)eactivity (I)nstrument (C)omponent (M)ajor

Op-Test No.:__2 __ Scenario No.: ____5_____ Event No.: ____1____ Page __1__ of _10__

Event Description: _____Swaps Cond. Pp Sets to evaluate Condenser air in leakage reduction_____

Time	Position	Applicant's Actions or Behavior
	BOP	Review Precautions and Limitations of OP C-7A:I, Condensate and Booster Pumps - Make Available
		Start Condensate Pump Set 1-3 per OP C-7A:I step 6.2.15
	RO	Monitor primary and secondary parameters during Condensate Pp Set start
	SFM	Direct BOP to start Condensate Pp Set 1-3 and shut down Condensate Pp Set 1-1.

Op-Test No.:__2 __ Scenario No.: ____5_____ Event No.: ____2____ Page __2__ of __10__

Event Description :_____Commence power increase through dilution _____ _____ _____

Time	Position	Applicant's Actions or Behavior
	BOP	Monitor plant parameters
	RO	Initiate dilution for ramp to 50% power • Set up makeup control system for dilution in batch mode (100-200 gals.)
		Set up DEHC • Place MW feedback in service • Set load reference • Set load rate • Raise VPL (Valve Position Limit)
		Commence ramp to 50% power
	SFM	• Review precautions and limitations of OP L-4 and conduct tailboard briefing
		Direct RO to commence a ramp to 50% power at 3-5 MW/min

p-Test No.:__2 __ Scenario No.: ____5_____ Event No.: ____3____ Page __3__ of __10__

Event Description :_____Loop 1 Wide range T-hot , TE-413A, fails high _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Subcooled Margin alarm, PK05-07
		Perform channel check and determine TE-413A has failed high
		Cut out TE-413A input into Subcooled Margin Monitor behind VB-2 per SFM direction
	RO	Acknowledge and report PK05-07, Subcooling Margin Lo/Lo-lo
		Monitor primary parameters to verify instrument failure
	SFM	Acknowledge reports of Subcooled margin alarm
		Go to AR PK05-07, Subcooling Margin Lo/Lo-lo • Direct channel checks to verify instrument failure • Determine TE-413A has failed high • Direct BOP to cut out TE-413A behind VB-2
		Refer to Tech Spec 3.3.3.6 •

		Need 1 per loop in 2 loops

-Test No.:__2 __ Scenario No.: ____5_____ Event No.: ____4____ Page __4__ of __10__

Event Description :_____Nuclear Instrument channel, N-43, fails high _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Identify and report alarms associated with N-43 failure
		Defeats N-43 at NI panel per SFM direction • Use OP AP-5 Attachment 4.1
	RO	Recognize and report unwarranted rod motion due to N-43 failure
		Place rod control in manual ** Critical Task
		Recover T-avg • Using rod control - 3 step pull and wait, or • Adjustment of turbine load
	SFM	Direct RO to place rod control in manual
		Enter OP AP-5 • Direct BOP to defeat N-43 at NI panel using attachment 4.1 • Direct RO to recover T-avg

		• use 3 steps pull and wait , or adjust turbine load
		Contact Maintenance Services to trouble shoot and repair N-43
		Consult Tech Specs • 3.3.1 - 6 hours to place in tripped condition • 4.2.4.1 - QPTR, calculate within 12 hours

Test No.:___2 ___ Scenario No.: _____5_____ Event No.: ____5____ Page __5__ of __10__

Event Description: _____Feedwater Reg valve, FCV-510, fails closed _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report loss of feedwater flow to S/G 1-1
		Open Bypass valve around FCV-510 to restore Feedwater flow to S/G 1-1
		Perform immediate actions of EOP E-0
	RO	Acknowledge alarm PK09-01, S/G 1-1 Press, Level, Flow
		Take manual control of S/G 1-1 feedwater control • Diagnose and report FCV-510 failed closed
		May commence down power ramp to reduce steam flow to match feedwater flow
		Manually trip the reactor at SFM direction
		Perform immediate actions of EOP E-0 • Recognize and report 3 rods stuck withdrawn following reactor trip (See Event 6)

t No.:__2 __

Scenario No.: ____5_____ Event No.: ____5 ___ Page __6__ of __10__

Event Description: _____ Feedwater Reg valve, FCV-510, fails closed _(continued)_____

Time	Position	Applicant's Actions or Behavior
	SFM	Acknowledge reports of no feedwater flow to S/G 1-1
		Direct BOP to open bypass valve around FCV-510 to restore feedwater flow to S/G 1-1
		Determine inadequate feedwater flow to S/G 1-1 • May direct RO to reduce load to get steam flow down • Direct RO to trip the reactor
		Direct immediate actions of EOP E-0 • Acknowledge reports of 3 rods stuck following reactor trip (See Event 6)
		Transition to EOP E-0.1

t No.:__2 __ Scenario No.: ____5_____ Event No.: ____6 ___ Page __7__ of __10__

Event Description: _____ Three control rods stick partially out on reactor trip _____

_____

Time	Position	Applicant's Actions or Behavior
	RO	Recognize and report 3 rods stuck out following reactor trip
		Implement Op AP-6, Emergency Boration
	SFM	Acknowledge reports of 3 rods stuck withdrawn following reactor trip
		At step 3 of EOP E-0.1 • Direct RO to Emergency Borate per OP AP-6

t No.:__2 __ Scenario No.: ____5_____ Event No.: ____7 ___ Page __8__ of __10__

Event Description: _____ Loop 3 small break LOCA ramping to a large break LOCA _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report symptoms of small LOCA
		Perform Immediate Actions of EOP E-0
		Recognize and report symptoms of a large LOCA
		Perform Appendix E of EOP E-0
	RO	Recognize and report symptoms of small break LOCA
		Perform manual Safety Injection as directed by SFM
		Perform immediate actions of EOP E-0
		Recognize and report symptoms of a large break LOCA
		Recognize and inform SFM when RCP trip criteria are met • Trip RCPs ** Critical Task
		Recognize and report failure of Containment Spray Pp 1-1 to start (See Event 8)

Op-Test No.:__2__ Scenario No.: ____5_____ Event No.: ____7 ___ Page __9__ of __10__

Event Description: _____ Loop 3 small break LOCA ramping to a large break LOCA _(continued) _____

_____

Time	Position	Applicant's Actions or Behavior
	SFM	Acknowledge reports of small break LOCA
		Direct RO to do a manual Safety Injection
		Transition back to EOP E-0
		Acknowledge reports of large break LOCA
		Acknowledge report of reaching RCP trip criteria
		Direct RO to trip RCPs ** Critical Task
		Containment Spray Pp 1-1 failure to start (See Event 7)
		Tailboard and transition to EOP E-1, Loss of Reactor or Secondary Coolant
	NOTE:	The scenario should be terminated after the crew tailboards the transition to EOP E-1.

NRC SCENARIO 05 SETUP

Op-Test No.:__2__ Scenario No.: ____5_____ Event No.: ____8 ___ Page __10__ of __10__

Event Description: _____ Safety Injection Pump 1-1 fails to start _____ _____ _____

Time	Position	Applicant's Actions or Behavior
	RO	Recognize and inform SFM of SIP 1-1 failure to start
		Starts SIP 1-1
	SFM	Direct RO to start SIP 1-1

SIMULATOR SET-UP

CONSOLE ENTRY	DESCRIPTION
INIT 33	Initialize the simulator at 30% power, equilibrium xenon, MOL
DRILL 6050	• No actions

Control Boards	• Shut down Condensate Booster Pump Set 1-2
	• Remove Main Feedwater Pp 1-2 from service
	  • Trip MFW Pp 12
	  • Take MFW Pp 1-2 out of Feedwater Control

	• Take individual control on CC3 to manual and run it to 0. • Place CAUTION sticker on MFW Pp 1-2 trip switch

NRC SCENARIO 05 SETUP

CONTROL BOARD SETUP

[ ] Copies of all commonly used forms and procedures

[ ] Any tags placed/removed as necessary

[ ] Plant Abnormal Status Board updated as necessary

[ ] Circuit Breaker Flags taken to correct position

[ ] Equipment status lamicoids placed correctly

BA Pp 1-2 **B.A. XFER PP SUPPLYING BLENDER**

CWP 1-1 **SUPPLYING IN-SERVICE SCW HX**

CWP 1-1 **AUTO RECLOSE FEATURE CUTIN ON THIS CWP**

CR Vent Trn 1 Bus F **SELECTED TO BUS 2F**

CR Vent Trn 1 Bus H **SELECTED TO BUS 1H**

[ ] Proper Delta-I curve for Simulator INIT on CC1

[ ] Rod Step Counters indicate correct position

[ ] PPC Setup:

- CC2: QP TAVG, ALM/MODE-1, QP CHARGING.
- Others: BIG U1169, MODE-1.
- RBU is updated.
- DELTAI is updated.
- PENS running.
- R2B blowdown flows at 80 gpm.

[ ] SPDS (screens and time updating), A screen "RM", B screen "SPDS".

[ ] Chart Recorders in operation

[ ] Ensure Annunciator Horn is on (BELL ON) and Sound Effects are on (SOUND ON)

[ ] ALL typewriters ON with adequate paper/ribbons/etc. and are in the "ON LINE" status

[ ] Video and audio recording systems disabled.

[ ] Communications systems turned on and functional

[ ] CREDIT/TEAM setup complete, if applicable

[ ] Print out copy of RISK ASSESSMENT

NRC SCENARIO 05 SETUP

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

INITIATES:

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
	var - E1	n/a	Starts Condensate Pp Set 1-3 and shuts down Condensate Pp Set 1-1.
	var - E2	n/a	Commence power increase through dilution.
X	**0 min**	**DRILL 6051**	**After normal operations have been sufficiently observed, load session MALS, OVRs, etc. by FILE or MANUALLY (below)**
	2 min - E3	xmt rcs35 3,700,0,600,d,0	Loop 1 Wide range T-hot, TE-413A, fails high.
	12 min - E4	mal nis6c act 200,5,1200,d,0	Nuclear Instrument channel N-43 fails high.
	22 min - E5	cnv mfw3 2,0,5,1800,d,0 cnv mfw9 2,0.6,0,0,c,rfwfrbv(1).gt.0.5,0	Failure of power to SV-510B causes Feedwater Reg valve FCV-510to fail closed. Feedwater bypass valve fails to open fully.
	Cond on - E6 trip	mal rod12a act 12,b6,0,d,0 mal rod12b act 6,h8,0,d,0 mal rod12c act 12,p10,0,d,0	Three control rods stick partially out on reactor trip.
	Cond on - E7 trip	mal rcs3c act 1000,600,180,c,jpplp4,jpplsi mal rcs2 act 3,2,10,c,jpplsi,0	Loop 3 small break LOCA ramping to a large break LOCA.
	Cond on - E8 SI	pmp sis1 1,0,0,0,d,0	Safety Injection Pump 1-1 fails to start.

NRC SCENARIO 05
CREW TURNOVER SHEET

1. Unit 1 is at 30% power middle of life and has been there for the last 3 days.
   L-4 has been completed up to step 6.1.11.d.

2. Current reactivity management conditions are:
   Diluting RCS approximately 10 gal. every 2 hours.

3. RCS Boron concentration is 1152 ppm.

4. Unit 2 is at 100% power and has been there for 201 days.

5. Main Feedwater Pump 1-2 is OOS for maintenance 3 days ago. Estimated RTS in 10 hours.

6. Following turnover the Condensate Polisher Foreman has requested starting Condensate Pump Set 1-3 and shutting down Condensate Pump Set 1-1.

7. After swapping Condensate Pump Sets, the crew is directed to increase power to 50%.

8. No one is in containment, no entries are expected.