Pressurizer level channel, LT-459, fails high,(Event 1) causing charging flow to back down. RCP seal flows decrease and low RCP seal flow alarms come in. PZR level alarm comes in. The failed channel is identified and PZR level control is placed in manual. The SFM enters OP AP-5 due to the level channel failure. An alternate channel is selected and level control is returned to auto.

Letdown isolation valve 8152 fails closed (Event 2). Letdown low flow alarm comes in and BOP reports no letdown flow due to 8152 being closed. The SFM should refer to AR PK04-21, Letdown Press / Flow / Temp. The SFM should direct the RO to place charging in manual at minimum flow.

Excess letdown is placed in service (Event 3) per OP B-1A:IV, CVCS - Excess Letdown - Place In Service and Remove From Service.

RCP vibration alarm comes in (Event 4). High vibration on RCP 1-1 requires orderly plant shutdown. SFM directs plant shutdown per OP L-4, Normal Operation at Power.

S/G 1-2 PORV controller fails high (Event 5) causing 10% steam dump valve ,PCV-20, to open. The BOP should place the controller in manual and attempt to close the valve. The valve will not respond in manual and the BOP will have to use the toggle switch override to close it.

RCP 1-1 trips and an ATWS occurs (Event 6). The crew should recognize the ATWS and the RO should manually trip the reactor. Following immediate actions of E-0, a transition to E-0.1 should be made.

A S/G 1-1 Tube rupture with Stuck open Safety valve (Event 7) occurs following the reactor trip. The BOP should identify the S/G with excessive steam flow. The RO may do a manual Safety Injection before a low pressure SI occurs. The SFM should transition back to E-0. The crew may elect to perform an early isolation of S/G 1-1. During E-0 the rupture of S/G 1-1 is identified and a transition to E-3 is made. At step 15 in E-3 with the ruptured and faulted S/G less than 225 psig, a transition to ECA-3.1 is made. The scenario should terminate when the crew gets to the point of RCS cooldown (Step 13 of ECA-3.1).

Charging pump 1-1 fails to start (Event 8) following the Safety Injection. The RO should identify the failure and manually start CCP 1-1.

Facility: DCPP Units 1 & 2 Scenario No.: 1 Op-Test No.: 3

Examiners: Operators:

Objectives: Evaluate the crew's ability to diagnose and respond to a PZR level channel failure.

Evaluate the crew's ability to diagnose and respond to a Letdown isolation valve failure.

Evaluate the crew's ability to diagnose and respond to an RCP vibration.

Evaluate the crew's ability to diagnose and respond to a S/G PORV controller failure.

Evaluate the crew in using EOPs during an ATWS.

Evaluate the crew in using EOPs during a S/G tube rupture with stuck open Safety valve.

Evaluate the crew 's ability to diagnose and respond to a CCP failure to start.

Initial Conditions: 75% power, equilibrium xenon, Middle of cycle (IC-26)

Turnover:

Time min	Event No.	Malf. No.	Event Type*	Event Description
3	1	xmt pzr40	I, RO	PZR level channel LT-459 fails high.
10	2	vlv cvc16	C, BOP	Letdown isolation valve 8152 fails closed.
15	3		N, BOP	Place Excess Letdown in service.
20	4	ser 1244	C,R, RO	RCP 1-1 vibration HIGH requiring power reduction.
37	5	cnh mss3	I, BOP	S/G 1-2 PORV controller fails high.
42	6	pmp rcp2	M, ALL	RCP 1-1 trip with ATWS.

cond on trip		mal ppl5a mal ppl5b		
cond on trip	7	mal rcs4a mal mss6a	M, ALL	S/G 1-1 Tube Rupture with Stuck Open Safety valve.
cond on SI	8	pmp cvc1	C, RO	Charging pump 1-1 fails to start.

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

Op-Test No.:__3__ Scenario No.: ____1_____ Event No.: ____1____ Page __1__ of __11__

Event Description: _____PZR level channel LT-459 fails high_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize indications of a PZR level channel failing high and report to the SFM • Low RCP seal flows and alarms • Alarm PK05-22, PZR Level Hi/Lo Control • LT-459 indicating higher than other channels
	RO	Recognize indications of a PZR level channel failing high and report to the SFM
		Place PZR level control in manual • Restore RCP seal flows • Restore PZR level to normal
		Restore PZR level control • Select alternate channel for control
	SFM	Acknowledge reports from BOP/RO
		May go to AR PK05-22, PZR Level Hi/Lo Control

		Go to OP AP-5 and direct operator recovery actions • Direct RO to take manual control of charging • Direct RO to select Alternate channel
		Contact Maintenance Services to trouble shoot and repair LT-459
		Consult Technical Specification 3.3.1 • Trip inoperable channel in 6 hours

Op-Test No.: __3__ Scenario No.: ____1_____ Event No.: ____2____ Page __2__ of __11__

Event Description :_____Letdown Isolation Valve 8152 fails closed_____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize indications of loss of letdown flow and report to SFM • Alarm PK04-21, Letdown Press / Flow / Temp • Letdown flow indication at zero • Determine 8152 closed • Isolate letdown
		Contact Maintenance Services / Aux Watch to investigate 8152
	RO	Reduce charging flow to minimum • Supply RCP seals only • Monitor PZR level
	SFM	Acknowledge reports from BOP
		Go to AR PK04-21, Letdown Press / Flow / Temp • Direct charging flow reduction to minimum •

		• Directs isolation of letdown • Direct investigation of cause of loss of letdown
		Directs Excess letdown to be placed in service per OP B-1A

p-Test No.:__3__ Scenario No.: ____1_____ Event No.: ____3____ Page __3__ of __11__

Event Description :_____Place Excess Letdown in service _____

_____ _____

Time	Position	Applicant's Actions or Behavior
	BOP	Place Excess Letdown in service per Op B-1A:IV, CVCS - Excess Letdown - Place In Service and Remove From Service • Adjust HCV-123 as necessary for flow requirements • Observe excess letdown temperature and pressure increasing as an indication of flow
	RO	Monitor PZR level • Adjust charging flow as required
	SFM	Direct actions of RO and BOP

Test No.:___3____ Scenario No.: _____1_____ Event No.: ____4____ Page __4__ of __11__

Event Description: _____ RCP 1-1 vibration high requiring power reduction_____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Report alarm PK05-05, RCP Vibration • Monitor RCP parameters on VB2
		Coordinate with RO to perform the power decrease as directed by SFM • Closely monitor primary and secondary parameters for proper response • Keep SFM appraised of plant conditions and status
	RO	Acknowledge alarm PK05-05, RCP Vibration • Monitor RCP parameters on PPC
		Coordinate with BOP to perform the power decrease as directed by SFM • Prepare the makeup system for boration and borate as required • Prepare DEHC and start load reduction as directed by SFM • Closely monitor primary and secondary parameters for proper response • Keep SFM appraised of plant conditions and status

Test No.:___3____ Scenario No.: _____1_____ Event No.: ____4____ Page __5__ of __11__

Event Description: _____ RCP 1-1 vibration high requiring power reduction_(continued)_____

Time	Position	Applicant's Actions or Behavior
	SFM	Acknowledge reports from BOP / RO
		Direct Operator/Engineer to vibration monitor on 4th floor of the Administration Building • Operator/Engineer determines which RCP is in alarm (RCP 1-1) • Operator/Engineer determines amount of vibration (Pump shaft = 17 mills, motor shaft = 17 mils, and motor frame = 0.35 in/sec)
		Determine that RCP 1-1 motor shaft and motor frame are in a DANGER condition
		Direct RO and BOP to commence an orderly plant shutdown per OP L-4
		Supervise / Coordinate actions for Unit power reduction per Op L-4
		Notify UES of plant shutdown

: No.:___3__ Scenario No.: ____1_____ Event No.: ____5 ___ Page __6__ of __11__

Event Description: _____S/G 1-2 PORV controller fails high _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report unwarranted opening of PCV-20
		Recognize and report failure of PCV-20 (S/G 1-2) controller to close valve • Controller doesn't respond in manual
		Close PCV-20 using toggle override switch (uses BU air to close)
	RO	Recognize and report unwarranted increase in steam flow
		Take actions as directed by SFM
	SFM	Acknowledge reports from BOP / RO
		Direct BOP to take manual control of PCV-20 and close it
		Contact Maintenance Services to investigate and repair
		Consult Tech Spec 3.7.1.6 • No action required since manual control with BU air is operable

st No.:__3__ Scenario No.: ____1_____ Event No.: ____6 ___ Page __7__ of __11__

Event Description: _____RCP 1-1 Trip with ATWS _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report RCP 1-1 trip • Breaker open • Blue light on • Loop flows low
		Perform Immediate Actions of EOP E-0 • Recognize failure of reactor to trip, ATWS • Report status to SFM
	RO	Recognize and report RCP 1-1 trip
		Perform Immediate Actions of EOP E-0 • Recognize and report failure of reactor to trip, ATWS
		Perform manual reactor trip ** Critical Task
		Inform SFM when reactor trips

		Isolate Excess Letdown as directed by SFM

st No.:__3__ Scenario No.: ____1_____ Event No.: ____6 ___ Page __8__ of __11__

Event Description: _____RCP 1-1 Trip with ATWS _____

_____

Time	Position	Applicant's Actions or Behavior
	SFM	Acknowledge reports from BOP / RO of RCP 1-1 trip
		Recognize failure of reactor to trip
		Directs RO to manually trip the reactor ** Critical Task
		Go to EOP E-0
		Transitions to E-0.1 • Direct Fold Out page items
		Direct isolation of Excess Letdown

st No.:__3__ Scenario No.: ____1_____ Event No.: ____7 ___ Page __9__ of __11__

Event Description: _____ S/G 1-1 Tube Rupture with Stuck Open Safety Valve _____

_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report S/G 1-1 excessive steam flow following reactor trip
		Recognize and report RCS pressure dropping toward auto Safety Injection point
		Isolate faulted S/G 1-1 per EOP E-2 • Isolate flow from the faulted S/G • Isolate flow to the faulted S/G ** Critical Task
		Recognize ruptured S/G 1-1 pressure less than 225 psig and report status to SFM
		Initiate an RCS cooldown to cold shutdown • Operate 10% steam dump valves on non-ruptured S/Gs • Monitor Tc and do not exceed a 100° F /hr cooldown rate ** Critical Task
	RO	Initiate manual Safety Injection as directed by SFM

		Take actions as directed by SFM
		Monitor Thermocouple temperatures and RCS Tc temperature and update BOP as he conducts a cooldown • Recognize when the 100° F/hr cooldown rate is reached

: No.:__3__ Scenario No.: ____1_____ Event No.: ____7 ___ Page __10__ of __11__

Event Description: _____ S/G 1-1 Tube Rupture with Stuck Open Safety Valve_(continued)

Time	Position	Applicant's Actions or Behavior
	SFM	Direct RO to do a manual Safety Injection
		Transition to EOP E-2 and Tailboard • Direct BOP to isolate faulted S/G 1-1
		Direct transition to EOP E-3 based on ruptured / faulted S/G 1-1 • Conduct tailboard
		Acknowledge that the ruptured S/G 1-1 pressure is less than 225 psig and direct transition to EOP ECA-3.1
		Conduct a tailboard prior to entering EOP ECA-3.1
		Direct an RCS cooldown to cold shutdown • Determine that the condenser is not available for steam dump operation • Direct the use of 10% steam dumps on intact S/Gs for cooldown ** Critical Task
		Direct stopping the cooldown when either •

		A cooldown rate of 100° F/hr is reached • or, It is determined that a cooldown exceeding the 100° F/hr already occurred
	NOTE	Terminate the scenario when the crew initiates RCS cooldown • Step 13 of EOP ECA-3.1

Op-Test No.:__3__ Scenario No.: ____1_____ Event No.: ____8 ___ Page __11__ of __11__

Event Description: _____ Charging Pump 1-1 fails to start
_____
_____
_____

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Charging Pump 1-1 failure to start following Safety Injection
	RO	Manually starts CCP 1-1
		Notifies SFM of CCP 1-1 actions
	SFM	Acknowledges actions of BOP

NRC SCENARIO 01 SETUP

SIMULATOR SET-UP

CONSOLE ENTRY	DESCRIPTION
INIT 26	Initialize the simulator at 75% power, equilibrium xenon, MOL.
DRILL 6010	• no actions
Control Boards	• no actions

NRC SCENARIO 01 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 **SELECTED TO BUS 2F**
Bus F

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

[ ] 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 01 SETUP

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

INITIATES:

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	**0 min**	**DRILL 6011**	**After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)**
	3 min	xmt pzr40 3,110,3600,180,d,0	LT-459 fails HIGH
	10 min	vlv cvc16 2,0,2,600,d,0	Letdown iso valve 8152 fails closed
X	**When asked**	**to locally check letdown HX room for high temp**	**Investigation finds room temperature normal**
X	**When asked**	**to locally determine problem with 8152.**	**Investigation finds that 8152 has broke air line**
	20 min	ser 1244 act,1,0,1200,d,0	RCP 1-1 vibration high
X	**When asked**	**to investigate RCP vibration.**	**Investigation reveals RCP 1-1: pump shaft = 17 mils motor shaft = 17 mils motor frame = 0.35 in/sec**
X	**When asked**	**to contact Engineering about RCP 1-1**	**Engineering recommends an orderly plant shut down and take RCP 1-1 off line**
	37 min	cnh mss3 2,1,5,2220,d,0	S/G 1-2 PORV controller fails high
	42 min	ppl5a act 1,0,0,d,0 ppl5b act 1,0,0,d,0 pmp rcp1 4,0,0,2520,d,0	RCP 1-1 trip with ATWS
	Conditional on RX trip	mal rcs4a act 400,60,0,c,jpplp4,0 mal mss6a act 100,120,20,c,jpplp4,0	S/G 1-1 tube rupture with stuck open safety valve
	Conditional on auto start	pmp cvc1 1,0,0,0,d,0	Charging Pump 1-1 fails to start

NRC SCENARIO 01
CREW TURNOVER SHEET

1. Unit 1 is at 75% power, equilibrium xenon, MOL and has been there 4 days.

2. Current reactivity management conditions are:
   Diluting RCS approximately 30 gal. every 2 hours.

3. RCS boron concentration is 1002 ppm.

4. Unit 2 is at 100% power and has been there for the last 30 days.

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