Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.: 1	Op Test No.: July 2010 NRC
Examiners:		Operators:	

Initial Conditions:	• 100% power MOL - RCS Boron is 910 ppm by Chemistry sample. • Train A Emergency Diesel Generator is OOS for governor repair.
Turnover:	Maintain steady-state 100% power conditions.
Critical Tasks:	• Trip Reactor Coolant Pumps Upon Loss of Subcooling. • Manually Initiate Containment Isolation Phase A Upon Failure to Automatically Actuate. • Maintain Core Cooling During a Loss of Cold Leg Recirculation.

Event No.	Malf. No.	Event Type*	Event Description
1 + min	RP06A	I (RO, SRO) TS (SRO)	Loop 1 N-16 Channel I (1-JI-411A/B) Fails High.
2 + min	RX18	I (BOP, SRO)	Feed Header Pressure Transmitter (PT-508) Fails High.
3 + min	CH03	C (BOP, SRO)	Neutron Detector Well Fan (FN-09) Motor Overcurrent.
4 + min	RX05B	I (RO, SRO) TS (SRO)	Pressurizer Level Channel (LT-460) Fails Low.
5 + min	RC17A	M (RO, BOP, SRO)	Large Break Loss of Coolant Accident (60 second ramp).
6 + min	RP09A RP09B	C (BOP)	Phase A Containment Isolation Trains A and B Fail to Automatically Actuate.
7 + min	RH01B	C (BOP)	Residual Heat Removal Pump (1-02) trip upon SI Sequencer Start.
8 + min	RHR15	C (RO)	Containment Sump to Residual Heat Removal Pump (1-01) Suction Isolation Valve (1-8811A) Will Not Open.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications

SCENARIO SUMMARY NRC #1

The crew will assume the watch and maintain steady-state conditions per IPO-003A, Power Operations. Train A Emergency Diesel Generator is out of service for governor repair.

The first event is a high failure of Loop 1 N-16 Channel I. Operator actions are per ABN-704, Tc/N-16 Instrumentation Malfunction, and include placing Rod Control in Manual and identifying the failed channel. The SRO will refer to Technical Specifications.

Once Technical Specifications are addressed, a Feedwater Header Pressure Transmitter fails high causing Main Feed Pump speed to decrease resulting in a drop in Feedwater flow. Operator actions are per ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 5.0, and require manual Feedwater Header pressure control until repairs are made.

When Feedwater Header pressure is stable, the running Neutron Detector Well Fan will trip. Actions are per ALM-0031A, 1-ALB-3A, Window 2.1 – CNTMT FN MASTER TRIP. The BOP will start the standby Neutron Detector Well Fan per SOP-801A, Containment Ventilation System, and monitor for proper operation.

The next event is a Pressurizer Level instrument failure. Actions are per ABN-706, Pressurizer Level Instrumentation Malfunction. The RO will take manual control of Pressurizer level or Charging flow to maintain Pressurizer Level on program. When the failed instrument is identified, an alternate controlling channel is selected and Charging flow and Pressurizer Level control will be returned to Automatic. Letdown flow will be restored per the Job Aid. The SRO will refer to Technical Specifications.

When Letdown flow is restored, a Large Break Loss of Coolant Accident develops inside Containment resulting in generation of signals for Safety Injection, Containment Isolation Phase A and Phase B. Train B Residual Heat Removal Pump will trip upon pump start and the Train A Containment Sump to RHR Pump Suction Isolation Valve will NOT open. Reactor Coolant Pumps must be manually tripped due to a loss of subcooling and Containment Isolation Phase A must be manually initiated.

The crew enters EOP-0.0A, Reactor Trip or Safety Injection and at Step 14, transitions to EOP-1.0A, Loss of Reactor or Secondary Coolant. While in EOP-1.0A, the crew should recognize and transition to ECA-1.1A, Loss of Emergency Coolant Recirculation, at Step 11. When in ECA-1.1A, the crew will secure Containment Spray Pumps as required per Containment pressure conditions.

The scenario is terminated when Containment Spray flow is reduced in ECA-1.1A or when the conditions of FRZ-0.1A, Response to High Containment Pressure, have been met.

Risk Significance:

- Risk important components out of service: Train A Emergency Diesel Generator
- Risk significant core damage sequence: LBLOCA with Loss of Coolant Recirculation
- Risk significant operator actions: Manually Trip Reactor Coolant Pumps
  Manually Initiate Containment Isolation
  Manually Secure Containment Spray Pumps

Appendix D	Scenario Outline	Form ES-D-1

Facility:	CPNPP 1 & 2	Scenario No.:	2	Op Test No.:	July 2010 NRC
Examiners:		Operators:			

Initial Conditions:	• 72% power MOL - RCS Boron is 916 ppm by Chemistry sample. • Train A Emergency Diesel Generator is OOS for governor repair.
Turnover:	Maintaining 72% power per Load Controller direction. Rod Control in AUTO.
Critical Tasks:	• Emergency Boration Required for Two Stuck Control Rods. • Perform Actions to Identify and Isolate Faulted Steam Generator. • Perform Actions to Initiate Feed Isolation to Faulted Steam Generator.

Event No.	Malf. No.	Event Type*	Event Description
1 + min	RX09A	I (RO, BOP, SRO) TS (SRO)	Main Turbine 1st Stage Pressure Transmitter (PT-505) Fails Low.
2 + min	CC02A CC03A	C (BOP, SRO) TS (SRO)	Train A Component Cooling Water Pump (1-01) Trip. Train B Component Cooling Water Pump (1-02) Auto Start Failure.
3 + min	RX08A	I (RO, SRO) TS (SRO)	Pressurizer Pressure Channel (PT-455) Fails Low.
4 + min	MS03A	M (RO, BOP, SRO)	Steam Generator (1-01) Steam Line Break Outside Containment Before Main Steam Isolation Valve (300 second ramp).
5 + min	RD04K6 RD04K8	C (RO)	Two Control Rods Fail to Insert Upon Reactor Trip. Emergency Boration Required.
6 + min	FW38 A/B/C/D	C (BOP)	Feed Line Isolation Valves (HV-2134 to HV-2137) Fail to Close.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications

SCENARIO SUMMARY NRC #2

The crew will assume the watch at 72% power with no scheduled activities per IPO-003A, Power Operations. The Grid Controller has requested that power remain at this level due to transmission line overload until further notice. Train A Emergency Diesel Generator is out of service for governor repair.

The first event is a Main Turbine 1st Stage Pressure Transmitter failure. The crew responds per ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure and Feed Header Pressure Instrument Malfunction, Section 4.0. Several actions are required on the part of the RO and BOP to stabilize plant conditions. The SRO will comply with Technical Specifications.

When plant conditions are stable, the Train A Component Cooling Water (CCW) Pump will trip and the Train B CCW Pump will fail to automatically start. The crew will respond per ABN-502, Component Cooling Water System Malfunctions, Section 2.0. The crew will manually start Train B CCW Pump and perform equipment adjustments as required by procedure. The SRO will refer to Technical Specifications.

When ABN-502 actions are complete, a Pressurizer Pressure Channel will fail low. The crew will respond per ABN-705, Pressurizer Pressure Malfunction, Section 2.0, and ensure Pressurizer Heaters are controlled and Power Operated Relief Valves remain closed. The SRO will refer to Technical Specifications.

When Technical Specifications have been addressed, a Main Steam Line Break Outside Containment before the Main Steam Isolation Valve will ramp in over five minutes on Steam Generator 1-01. With lowering Pressurizer pressure and Reactor Coolant System temperature, the Unit Supervisor will direct a Reactor and Turbine Trip.

The crew will enter EOP-0.0A, Reactor Trip or Safety Injection, and then transition to EOP-2.0A, Faulted Steam Generator Isolation, at Step 12. While performing the actions of EOP-0.0A, the RO will be required to manually initiate an Emergency Boration due to two stuck Control Rods and the BOP will manually close the Feed Line Isolation Valves while in Attachment 2.

Once the faulted Steam Generator is isolated, the Unit Supervisor will transition to EOS-1.1A, Safety Injection Termination.

The scenario is terminated after EOS-1.1A, Safety Injection Termination, is entered and the actions to secure Safety Injection flow are performed.

Risk Significance:

- Risk important components out of service: Train A Emergency Diesel Generator
- Failure of risk important system prior to trip: Train A Component Cooling Water System
- Risk significant core damage sequence: Main Steam Line Break Outside Containment
- Risk significant operator actions: Emergency Borate Due to Two Stuck Rods
  Isolate Faulted Steam Generator
  Isolate Feedwater to Faulted SG

Facility:	CPNPP 1 & 2	Scenario No.:	3	Op Test No.:	July 2010 NRC
Examiners:		Operators:			

Initial Conditions:
- ~1X10^{-8} amps BOL - RCS Boron is 1545 ppm by Chemistry sample.
- Steam Dump System in service for RCS Temperature Control.

Turnover: Raise Power to 2% in preparation for plant startup to 100% power.

Critical Tasks:
- Restore Feedwater Flow to any Affected Steam Generator.
- Determine Inadvertent Safety Injection & Secure Charging Prior to Pressurizer Overfill.
- Determine Loss of Coolant Accident in Progress and Reinitiate Safety Injection.

Event No.	Malf. No.	Event Type*	Event Description
1 + min		R (RO) N (BOP, SRO)	Raise Reactor power to 2%.
2 + min	FW24A	C (BOP) TS (SRO)	Motor Driven Auxiliary Feedwater Pump (1-01) Trip.
3 + min	RP17D	TS (SRO)	Containment Pressure Transmitter (PT-937) Fails High.
4 + min	MS13B	I (BOP, SRO)	Atmospheric Relief Valve (1-02) Fails Open due to Steam Pressure Transmitter (PT-2326) Failure.
5 + min	RP14A	M (RO, BOP, SRO)	Spurious Train A Safety Injection Actuation Signal.
6 + min	CV01B CV01E	C (RO)	Centrifugal Charging Pump (1-01) Trip. Centrifugal Charging Pump (1-02) SI Sequencer Start Failure.
7 + min	RC17C	C (RO)	Loss of Coolant Accident at 1700 gpm Following Isolation of High Head Injection.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Technical Specifications

SCENARIO SUMMARY NRC #3

The crew will assume the watch with a Plant Startup in progress and will continue raising power to approximately 2% per IPO-002A, Plant Startup from Hot Standby.

When conditions are stable, Motor Driven Auxiliary Feedwater Pump 1-01 will trip. The crew will refer to ABN-305, Auxiliary Feedwater System Malfunction, Section 3.0, and determine that Steam Generator levels are slowly decreasing and start the Turbine Driven Auxiliary Feedwater Pump. The SRO will refer to Technical Specifications.

When the Steam Generator levels are stable, a Containment Pressure Transmitter will fail high. Crew response will be per ALM-0022A, 1-ALB-2B, Window 3.10, CNTMT 1 OF 4 PRESS HI-3, and include verifying that only one channel is affected. The SRO will refer to Technical Specifications.

When Technical Specifications have been referenced, a Steam Generator Atmospheric Relief Valve (ARV) fails open due to a Main Steam Pressure Transmitter failure. This event is recognized by a Reactor power increase and the ARV Controller indicating 100% demand. The BOP will place the affected Controller in Manual and close the ARV. ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 2.0, will be referenced.

The major event begins with a spurious Train A Safety Injection Actuation Signal. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection, and perform immediate actions including actuation of both Trains of Safety Injection.

When it is determined that a spurious Safety Injection actuation has occurred, the crew will transition to EOS-1.1A, Safety Injection Termination. During the event the Train A Centrifugal Charging Pump will trip and the Train B Centrifugal Charging Pump will fail to auto start on the Safety Injection Sequencer.

When the high head injection alignment is secured in EOS-1.1A, a Small Break Loss of Coolant Accident will occur. This will require re-initiation of Safety Injection flow per the Foldout Page Criteria of EOS-1.1A.

Event termination will occur when the crew has reinitiated Safety Injection and transitioned to EOP-1.0A, Loss of Reactor or Secondary Coolant.

Risk Significance:

- Failure of risk important system prior to trip: Loss of MDAFW Pump
  SG Atmospheric Relief Valve Failure
- Risk significant core damage sequence: Small Break LOCA Following SI Termination
- Risk significant operator actions: Initiate Charging Flow upon Safety Injection
  Secure Charging Prior To Pressurizer Overfill
  Reinitiate Safety Injection Flow

Facility: CPNPP 1 and 2		Date of Exam: 07/07/10									Operating Test No.: NRC						
APPLICANT	EVENT TYPE	SCENARIOS												TOTAL	MINIMUM(*)		
		CPNPP #1			CPNPP #2			CPNPP #3									
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SROI	RX	-	-	-	-	-	-	-	-	-					**1**	**1**	**0**
	NOR	-	-	-	-	-	-	1	-	-					**1**	**1**	**1**
	I/C	1,2,3,4	-	-	1,2,3	-	-	2,4	-	-					**4**	**4**	**2**
	MAJ	5	-	-	4	-	-	5	-	-					**2**	**2**	**1**
	TS	1,4	-	-	1,2,3	-	-	2,3	-	-					**0**	**2**	**2**
RO	RX	-	-	-	-	-	-	-	1	-					**1**	**1**	**0**
	NOR	-	-	-	-	-	-	-	-	1					**1**	**1**	**1**
	I/C	-	1,4,8	2,3,6,7	-	1,3,5	1,2,6	-	6,7	2,4					**4**	**4**	**2**
	MAJ	-	5	5	-	4	4	-	5	5					**2**	**2**	**1**
	TS	-	-	-	-	-	-	-	-	-					**0**	**2**	**2**

Instructions:

1.	Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2.	Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3.	Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.